

**MODEL QUESTIONS  
for  
TEZPUR UNIVERSITY ENTRANCE EXAMINATION**

[Candidates are to sit for Tezpur University Entrance Examinations (TUEE), 2014 to be held during May 31 and June 01 to June 02, 2014. Entrance Examinations for all programmes will be of two hours duration]



*Candidates are advised to check the University website for any update in model questions for practice*

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## DEPARTMENT OF BUSINESS ADMINISTRATION

### PG Diploma in Tourism Management

#### Course Outline and Test pattern:

The written test of objective type will consist of General knowledge, Test of Reasoning and Test of English. Shortlisted candidates (based on the written test) may have to appear for a personal interview. Information regarding personal interview will be given in the website along with declaration of shortlisted candidates.

*The Written Test consists of the following:*

1. Test of GK: 40 marks;
2. Test of English: 30 marks;
3. Test of reasoning: 30 marks.

#### **Model questions:**

##### **General Knowledge:**

1. Which is the largest sugarcane producing state in India?  
(a) Bihar (b) Andhra Pradesh (c) Uttar Pradesh (d) Assam
2. Which particular city is known as the "Garden City" of India?  
(a) Mysore (b) Bangalore (c) Agra (d) Varanasi
3. Mother Teresa arrived in India from Europe in the year  
(a) 1910 (b) 1921 (c) 1929 (d) 1939
4. What is the name of the currency of Russia?  
(a) Mark (b) Yen (c) Ruble (d) Peso

##### **English :**

1. Which of the Phases marked (a), (b), (c) and (d) given below should replace the phrase given in bold in the following sentences.

She cooks, washes dishes, does her homework and **takes relaxing**.

- (a) relaxing then (b) then relaxes (c) then relaxing (d) take relaxes

- Q. Fill in the blanks with the help of the alternatives given below:

Charles Darwin was ..... (2) .....to his studies to a point of madness. However, his findings .....(3) .....fruits when he got success in propagating the evolutionary principles. According to this theory, there is always ..... (4) ..... for existence or the ..... (5) .....of the fittest. This theory taught man to ..... (6).....himself to his prevailing environment.

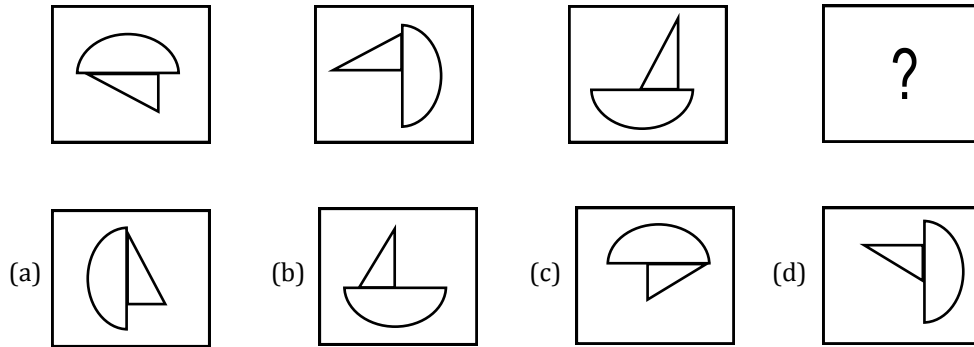
2. (a) Addicted (b) Devoted (c) Given (d) Recommended
3. (a) Bore (b) Gave (c) Carried (d) Indicated
4. (a) Efforts (b) Striving (c) Struggle (d) Fight
5. (a) Life (b) Survival (c) Dominance (d) Destruction
6. (a) Adapt (b) Adopt (c) Adept (d) Adhere

##### **Reasoning :**

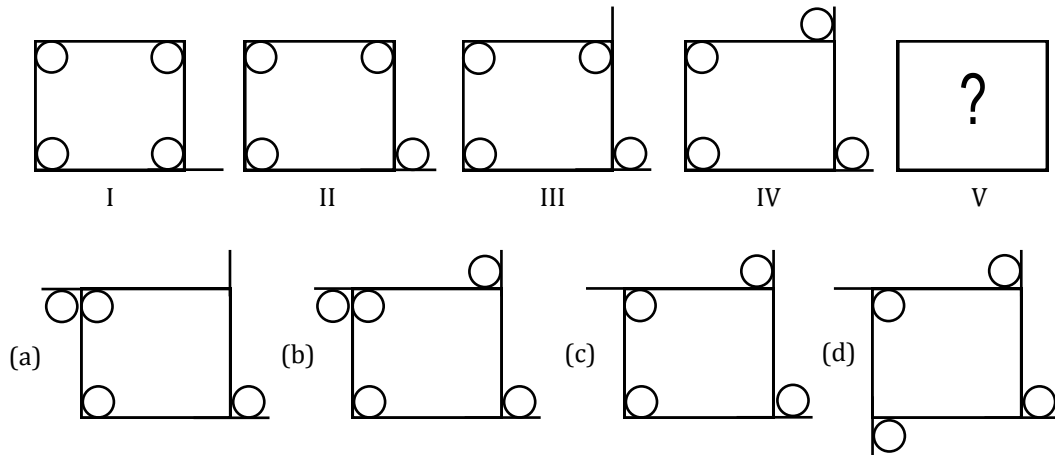
1. The age of a man is three times the sum of the ages of his two sons. Five years after, his age will be double the sum of the ages of his sons. The father's present age is  
(a) 40 years (b) 45 years (c) 50 years (d) 55 years
2. A town 'P' is located in a particular district. The town 'A' is West of P. Town 'T' is East of 'P'. Town 'K' is East of 'B' but West of 'T' and 'A'. They are all in the same district. Which town is the farther West?  
(a) P (b) K (c) B (d) A

*Non-Verbal Reasoning:*

1. Which pattern should come in the place (?)



2. In above set of figures (I) to (IV), some parts are shown to change their positions in a regular direction. Following the same sequence, which one of the following will appear at the fifth stage ?



**Answers:**

General Knowledge : 1(b), 2(c), 3(a), 4(c), 5(c)

English : 1(b), 2(b), 3 (a), 4(c), 5(b), 6(a)

Reasoning : 1(b), 2(c)

Non-Verbal Reasoning : 1(1), 2(c)

DEPARTMENT OF COMMERCE

Integrated M. Com.

**Course Outline and Test pattern:**

The test paper shall consist of 100 multiple choice questions having six sections viz. General Knowledge (15 questions), knowledge about business/socio-economic environment (15 questions), test of Reasoning (15 questions), test of English (20 questions), data interpretation (15 questions) and test of arithmetic/mathematics (20 questions).

**There will 0.25 negative marks for each incorrect answer.**

**Model questions:**

**Section A: General Knowledge**

Which is the largest river in the world?

- (a) Amazon (b) Nile (c) Yangtze (d) Congo

Who was the first President of India?

- (a) Dr. Zakir Hussain (b) Dr. S. Radhakrishnan (c) Dr. Rajendra Prasad (d) Dr. S.D. Sharma

**Section B: Knowledge about Business/Socio-Economic Environment**

Who is the present Governor of Reserve Bank of India?

- (a) Mantek Singh Ahluwalia (b) Nandan Nilekani  
(c) Raghuram Rajan (d) Partha Sarathi Shome

Which of the following Five-Year Plan is currently going on in India?

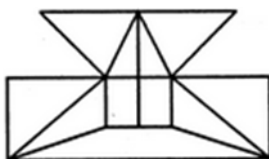
- (a) Tenth Five Year Plan (b) Eleventh Five Year Plan  
(c) Twelfth Five Year Plan (d) Thirteenth Five Year Plan

**Section C: Test of Reasoning**

1. In a certain code, FIRE is written as QHOE and MOVE is ZMWE. Following the same rule of coding, what should be the code for the word OVER?

- (a) MWOE (b) MWZO (c) MWED (d) MWEO

2. Find the minimum number of straight lines required to make the given figure.



- (a) 16 (b) 17 (c) 18 (d) 19

**Section D: Test of English**

Fill in the gap:

The boy is not \_\_\_\_\_ tall to reach the top.

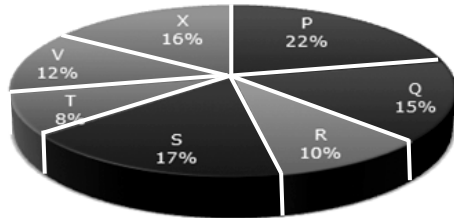
- (a) very (b) much (c) too (d) enough

2. Find the correctly felt word  
 (a) Employd (b) Beterment (c) Treatmeant (d) Efficient

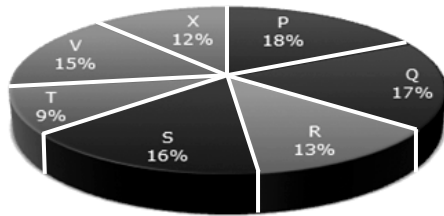
**Section E: Data Interpretation**

Distribution of candidates who were enrolled for MBA entrance exam and the candidates (out of those enrolled) who passed the exam in different institutes

Candidates Enrolled = 8550



Candidates who Passed the Exam = 5700



1. What percentage of candidates passed the Exam from institute T out of the total number of candidates enrolled from the same institute?  
 (a) 50% (b) 62.5% (c) 75% (d) 80%
2. Which institute has the highest percentage of candidates passed to the candidates enrolled?  
 (a) Q (b) R (c) V (d) T

**Section F: Test of Arithmetic/Mathematics**

1.  $\frac{2}{5}$ th of Ram's salary is equal to Mohan's salary and  $\frac{7}{9}$  of Mohan's salary is equal to Sohan's salary. If the sum of the salary of all of them is Rs. 77,000, then how much is Mohan's salary?  
 (a) Rs. 45,000 (b) Rs. 18,000 (c) Rs. 15,000 (d) Rs. 28,000
2. The market price of an article is Rs. 200. A discount of 12.50% is allowed on the market price and a profit of 25% is made. The cost price of the article is?  
 (a) Rs. 200 (b) Rs. 175 (c) Rs. 120 (d) Rs. 140

**Answers:**

Section A: 1(a), 2(c)      Section B: 1(c), 2(c)      Section C: 1(d), 2(b)  
 Section D: 1(d), 2(d)      Section E: 1(c), 2(b)      Section F: 1(b), 2(d)

## DEPARTMENT OF CHEMICAL SCIENCES

### M. Sc. in Chemistry

#### Course Outline and Test pattern:

The questions are on the basis of B.Sc. (Chemistry Major) syllabus along with 10+2 standard Mathematics, Physics, Biology and General Aptitude. The test comprises of all objective type questions. The distribution of marks is as per the following - General Science (10), Physical Chemistry (30), Organic Chemistry (30) and Inorganic Chemistry (30).

#### Model questions:

1. Metals like silver and copper can be obtained in the colloidal state by  
(a) peptisation (b) Bredig's arc method (c) dialysis (d) coagulation
2. The coagulation of 10 cm<sup>3</sup> of gold solution is completely prevented by addition of 0.025 g of starch to it. The Gold Number of starch is  
(a) 0.025 (b) 0.25 (c) 2.5 (d) 25
3. How many layers are adsorbed in chemical adsorption?  
(a) one (b) two (c) many (d) zero
4. In coagulating the colloidal solution of As<sub>2</sub>S<sub>3</sub> which has the minimum coagulating value?  
(a) NaCl (b) KCl (c) BaCl<sub>2</sub> (d) AlCl<sub>3</sub>
5. Milk can be preserved by adding a few drops of  
(a) Formic acid solution (b) Formaldehyde solution  
(c) Acetic acid solution (d) acetaldehyde solution
6. For the reaction  $4 \text{NH}_3 (\text{g}) + 7 \text{O}_2 (\text{g}) \rightleftharpoons 4 \text{N}_2 (\text{g}) + 2\text{H}_2\text{O} (\text{g})$ ,  $K_p/K_c$  is  
(a) RT (b) 1/RT (c) 1 (d) (RT)<sup>2</sup>
7. The solubility product of a sparingly soluble salt AB at room temperature is  $1.21 \times 10^{-6} \text{ M}^2$ . Its molar solubility is  
(a)  $1.21 \times 10^{-6} \text{ M}$  (b)  $1.1 \times 10^{-4} \text{ M}$  (c)  $1.1 \times 10^{-3} \text{ M}$  (d)  $1.21 \times 10^4 \text{ M}$
8. The number of components, phases and degrees of freedom for a eutectic mixture in a binary system is ...,...,... respectively.  
(a) 1,3,0 (b) 2,2,2 (c) 1,1,2 (d) 2,1,3
9. Which of the following techniques is employed to experimentally evaluate phases  
(a) Thermal analysis (b) Gravimetric analysis  
(c) Volumetric analysis (d) None of the above
10. The rate determining step of carbonylation of methanol to produce acetic acid is  
(a) Reductive elimination of CH<sub>3</sub>COI (b) CO insertion  
(c) Oxidative addition of CH<sub>3</sub>I (d) Formation of CH<sub>3</sub>COOH
11. The Pd metal throughout the course of reaction in the Wacker process exhibit oxidation state of  
(a) +2 and +1 (b) +2 and 0 (c) +3 and +2 (d) +1 and 0
12. In case of very high substrate concentrations, the rate equation of enzyme catalysis is given by

$$(a) \quad r = k_2 [E]_{tot} \quad (b) \quad r = \frac{k_2}{k_m} [E]_{tot} [S] \quad (c) \quad r = k_2 [E] [S] \quad (d) \quad r = \frac{k_2}{k_m} [E] [S]$$

**Course Outline and Test pattern:**

Test comprising of 50 objective type questions in two sections. The first section shall contain 35 questions in Chemistry and the second section shall contain 15 questions from Biology, Mathematics, Physics & General. Each question carries 2 marks and **0.5 marks will be deducted for each wrong answer.**

1. Which of the following orderings gives the correct sequence of bond enthalpy terms for covalent bonds involving group 14 elements?
 

(a) C-C > Si-Si > Ge-Ge > Sn-Sn	(b) C-C < Si-Si > Ge-Ge > Sn-Sn
(c) C-C < Si-Si < Ge-Ge < Sn-Sn	(d) C-C > Si-Si < Ge-Ge < Sn-Sn
  
2. Benzene is a
 

(a) Saturated hydrocarbon	(b) Unsaturated hydrocarbon
(c) Super saturated hydrocarbon	(d) All
  
3. The correct order of relative strengths of hydrogen bonding in the given hydrides is
 

(a) H <sub>2</sub> S > H <sub>2</sub> O > NH <sub>3</sub> > PH <sub>3</sub>	(b) HCl > H <sub>2</sub> O > H <sub>2</sub> S > NH <sub>3</sub>
(c) NH <sub>3</sub> > PH <sub>3</sub> > H <sub>2</sub> O > HF	(d) HF > H <sub>2</sub> O > NH <sub>3</sub> > PH <sub>3</sub>
  
4. All the following species are strong oxidizing agents. Their strength as oxidising agents in acidic solution is
 

(a) S <sub>2</sub> O <sub>8</sub> <sup>2-</sup> > Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup> > MnO <sub>4</sub> <sup>-</sup>	(b) MnO <sub>4</sub> <sup>-</sup> > Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup> > S <sub>2</sub> O <sub>8</sub> <sup>2-</sup>
(c) S <sub>2</sub> O <sub>8</sub> <sup>2-</sup> > MnO <sub>4</sub> <sup>-</sup> > Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	(d) MnO <sub>4</sub> <sup>-</sup> > S <sub>2</sub> O <sub>8</sub> <sup>2-</sup> > Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>
  
5. Isomers which can be interconvertible through rotation around a single bond are
 

(a) conformers	(b) diastereomers
(c) enantiomers	(d) positional isomers
  
6. A functional group common to both amines and amides is
 

(a) -COOH	(b) -CHO
(c) -NH <sub>2</sub>	(d) -OH
  
7. Which of the following is an essential ingredient in Baking Powder?
 

(a) Na <sub>2</sub> CO <sub>3</sub>	(b) Na <sub>2</sub> SO <sub>4</sub>
(c) NaHCO <sub>3</sub>	(d) K <sub>2</sub> CO <sub>3</sub>
  
8. The oxidation state of S in H<sub>2</sub>SO<sub>4</sub> is
 

(a) 2+	(b) 4+
(c) 6+	(d) 0



## M. Tech. in Polymer Science and Technology

### Course Outline and Test pattern:

The test papers shall have questions based on chemical science related subjects (Chemistry/ Polymer Science/Applied Chemistry) at Master's degree level and allied subjects (Polymer Sci. & Tech./Fibre Sci. & Tech./ Rubber Tech. / Plastic Tech./ Chemical Engineering) at professional (B.Tech./B.E.) degree level. Candidates with valid GATE score will get preference.

### Model questions:

1. The degree of polymerization of polypropylene with molecular weight 126000 g/mole is  
(a) 1000                                      (b) 3000                                      (c) 500                                      (d) 10000
2. Nylon 6,6 is produced by –  
(a) Addition                                      (b) self- condensation  
(c) cross-condensation                                      (d) ring opening polymerization process.
3. Which one is not a colligative property of a solution?  
(a) Osmotic Pressure                                      (b) lowering of vapour pressure  
(c) Molecular weight                                      (d) Depression freezing point
4. The efficiency of any real heat engine is  
(a) Equal to Carnot efficiency                                      (b) greater than Carnot efficiency  
(c) Less than Carnot efficiency                                      (d) Cannot be produced
5. Thermoplastics are  
(a) soluble                                      (b) flowable                                      (c) fusible                                      (d) All of these
6. Viscose rayon is  
(a) cellulose nitrate                                      (b) regenerated cellulose nitrate  
(c) regenerated cellulose acetate                                      (d) none of these
7. Ziegler process  
(a) produces high density polyethylene                                      (b) produces low density polyethylene  
(c) uses no catalyst                                      (d) employs very high pressure
8. The mechanical strength of the following materials follows the order:  
(a) plastics > rubbers > fibres                                      (b) rubbers > plastics > fibres  
(c) fibres > plastics > rubbers                                      (d) fibres > rubbers > plastics
9. Degrees of freedom at triple point will be  
(a) 3                                      (b) 1  
(c) 2                                      (d) 0

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Master of Computer Application (MCA)

Course Outline and Test pattern: (Updated and different from the printed version)

The entrance examination question paper will contain three sections:

1. Section I (Logical Reasoning) : 40 marks
2. Section II (Mathematics 10+2 level or Computer Basics) : 30 marks
3. Section III (English Composition & Comprehension) : 30 marks

Candidate needs to score minimum qualifying marks in each section.

To qualify for selection a candidate must secure at least 20% marks in each of the sections.

Model questions:

Section I

In this section every correct answer will fetch 2 (two) marks and *for every wrong answer 1 (one) mark will be deducted.*

1. What is the next number in the series - 121, 169, 289, 361, 526, \_?  
(a) 841 (b) 625 (c) 784 (d) 729
2. A cube with all sides painted is divided into small cubes of equal sizes. The edge of a small cube is exactly one-fourth as that of the original cube. Therefore, the number of small cubes with only one side painted is -  
(a) 4 (b) 6 (c) 12 (d) 24

Section II

In this Section answer questions from either Group A or Group B.

Group A

Each correct answer will fetch 2.5 (two and half) marks and *for every wrong answer 1 (one) mark will be deducted.*

1. The number of two digit numbers that can be written by using the digits 2 and 3 is  
(a)  $^{10}C_2 + ^9C_2$  (b)  $2^{10}$  (c)  $2^{10} - 2$  (d) None of these
2. The term independent of x in the expansion of  $(x^2 - 1/x)^4$  is  
(a) 1 (b) -1 (c) 48 (d) 0

Group B

Each correct answer will fetch 2 (two) marks and *for every wrong answer 1 (one) mark will be deducted.*

1. The 8 bit 's complement binary representation of -35 is  
(a) - 00100011 (b) 11100011 (c) 110111101 (d) 10110001
2. An EPROM with 16-bit address bus and 4-bit data bus contains -  
(a) 32 KB (b) 64 KB (c) 256 KB (d) 128 KB

Section III

Questions in this section will be multiple-choice type in the following three domains. Each correct answer fetch 1(one) mark and for every wrong answer 0.5 (half) mark will be deducted.

1. Comprehension: Read a given passage and answer the set of questions based on it. 10 marks
2. Vocabulary test. 10 marks
3. Grammar and composition test. 10 marks

**M. Tech. in Information Technology**

**Course Outline and Test pattern: (Updated and different from the printed version)**

The written test will be based on Programming in C, Computer Organization, Data Structures, Operating Systems, System Software, Computer Network, DBMS and Theory of Computation.

There are three sections A, B and C in the question paper. There will be a minimum qualifying score for each section.

**Model questions:**

**SECTION - A**

*This section consists of 40 questions. For each question, a correct answer will fetch 1 mark, whereas for incorrect answer 0.5 marks will be deducted.*

1. Minimum number of flip-flops required to implement a mod-20 counter is  
(a) 20                                      (b) 5                                      (c) 3                                      (d) 4
2. Belady's Anomaly is related to  
(a) Computer Network                                      (b) Operating systems  
(c) Software Engineering                                      (d) None of these

**SECTION - B**

*This section consists of 15 questions. For each question, a correct answer will fetch 2 marks, whereas for incorrect answer 1 mark will be deducted.*

1. The in-order and post-order traversal of a binary tree yield the following sequences of nodes.  
In-order:                      EACKFHDBG  
Post-order:                      ECKAHBGDF  
Which is the Pre-order traversal sequence of the tree?  
(a) FAEKCDHGB                      (b) EKCABHGDGF                      (c) EAKCBHGDGF                      (d) EAKCBHGFDF

**SECTION - C**

*This section consists of 10 questions on C-programming. For each question, a correct answer will fetch 3 marks, whereas for incorrect answer 1.5 marks will be deducted.*

1. Consider the following C function which is supposed to check if a number is a prime number or not. The condition in the "if statement" is missing which is shown as **XXX**. Choose the correct option to replace **XXX** in the program.  
void main(){  
int n,i;  
scanf("%d", &n);  
for(i=2;i<n;i++)  
if(n%i==0)break;  
if(**XXX**) printf("prime");  
else printf("Not prime");  
}  
  
(a) i!=n                                      (b) i==n                                      (c) i<=n                                      (d) i>=n

DEPARTMENT OF CULTURAL STUDIES

**M. A. in Cultural Studies**

**Course Outline and Test pattern:**

The written test includes questions (descriptive as well as objective type) covering (a) General Information on North East India, particularly Assam, (b) Elementary Knowledge about the artistic and cultural heritage of India with particular reference to the North East India. The candidates may have to face an interview.

The test paper consists of 2 parts. Part A consists of 25 multiple choice questions of 2 marks each and Part B consists of descriptive questions of 50 marks.

**Model questions:**

**Part A**

**Type 1 (Find the correct option)**

1. Kimono is worn by a ..... women.  
(a) Kenya (b) Sudanese (c) Japanese (d) Mexican
2. Dhokla is a ..... food item  
(a) Bengali (b) Assamese (c) Tamil (d) Gujrati

**Type 2 (Mark the odd one out of the following)**

3. (a) MughlaiChiken (b) Biryani (c) Kebeb (d) Chowmein
4. (a) Sachin Tendulkar (b) Yuvraj Singh (c) Dinesh Kartik (d) PankajAdvani

**Type 3 (Match the following)**

5. Match List I and List II and select answer using the codes given below
- |                |               |
|----------------|---------------|
| X. Dokhna      | i. Literature |
| Y. JumpaLahiri | ii. Mising    |
| Z. Ribigaseng  | iii. Bodo     |
| W. Ravi Sankar | iv. Sitar     |

Codes	X	Y	Z	W
(a)	iii	ii	i	iv
(b)	iii	i	ii	iv
(c)	i	ii	iv	iii
(d)	iv	ii	iii	i

**Part B**

**Comprehension Test**

6. Read the following passage and answer the questions. (5 questions) 4x5=20
7. Write short notes (any four questions) 5x4=20
- |                                 |                          |
|---------------------------------|--------------------------|
| (i) Women in TV soaps           | (ii) Shopping Mall       |
| (iii) Multiplex and Cinema      | (iv) Fashion Industry    |
| (v) 24x7 news channels in Assam | (vi) VCD movies in Assam |

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### M. Tech. in Electronics Design and Technology

#### Course Outline and Test pattern:

B.E. or equivalent level courses on Electronics and Communication Engineering, Electrical Engineering, AMIE in Electronics, M.Sc. in Physics with Electronics as special paper, M.Sc. in Electronics Sciences.

***There will be negative marking. For every wrong answer 1/4 th of the marks will be deducted.***

#### Model questions:

- Which of the following meters has the highest accuracy?  
(a) moving iron meter (b) moving coil meter  
(c) rectifier type meter (d) thermocouple meter
- The internal resistance of an ammeter should be very low in order to have  
(a) high accuracy (b) high sensitivity  
(c) maximum voltage drop (d) minimum effect on the across the meter current in the circuit
- For the root locus plot of the system having the loop transfer function given by  
(a) no breakaway point (b) three real breakaway point  
(c) only one breakaway point (d) one real and two complex breakaway points
- A Class-A transformer coupled, transistor power amplifier is required to deliver a power output of 10 W. The maximum power rating of the transistor should not be less than  
(a) 5 W (b) 10 W (c) 20 W (d) 40 W
- The early effect in a bipolar junction transistor is caused by  
(a) fast turn on (b) fast turn off  
(c) large collector base reverse bias (d) large emitter base forward bias
- In an 8085 microprocessor system with memory mapped I/O  
(a) I/O devices have 16 - bit address  
(b) I/O devices are accessed using IN and OUT instruction  
(c) there can be a maximum of 256 input  
(d) arithmetic and logic and 256 output devices operations can be directly performed with the I/O data.
- The minimum number of NAND gates required to implement the Boolean function is equal to  
(a) 3 (b) 1 (c) 4 (d) 7
- An amplitude modulated voltage has modulation index of 100%. If the carrier is suppressed, the percentage power saving is  
(a) 50 % (b) 66.6% (c) 75 % (d) 25 %
- The drawback of FM relative to AM is that  
(a) noise is very high for high  
(b) larger bandwidth is required modulation frequencies  
(c) higher modulating power is required  
(d) higher output power is required.

## M. Tech. in Bioelectronics

### Course Outline and Test pattern:

B.E./B.Tech. level courses in Electronics Engineering, Electrical Engineering, Instrumentation Engineering, Communication Engineering, Biomedical Engineering, Chemical Engineering, Bioengineering, Computer Science & Engineering, Biotechnology, MBBS level, M.Sc. level courses on Chemistry, Biophysics, Molecular Biology, Cell Biology, Molecular Biology & Biotechnology, Polymer Science and Electronics.

There will be two parts in the question paper, part A and part B. Each part will contain 50 questions and candidates have to **answer either Part A or Part B**. Each Question will carry equal marks. ***There will be negative marking. For every wrong answer 1/4th of the marks will be deducted.***

### Model questions:

#### PART A

1. Electro- Encephalograph is
  - (a) Diagnostic tool for heart ailment
  - (b) Diagnostic tool for Brain ailment
  - (c) Instrument used for measuring blood pressure
  - (d) Instrument used to hear pulse/heart beat
  
2. In modern electronic multimeters a FET or MOSFET is preferred over BJT because
  - (a) Its input resistance is high
  - (b) Its input resistance is high and does not vary with change of range
  - (c) Its input resistance is low
  - (d) None of these
  
3. A dc electronic voltmeter using chopper stabilization is free from errors due to
  - (a) Low CMRR
  - (b) Amplifier drift
  - (c) Source output impedance
  - (d) Interference
  
4. Feedback in an amplifier
  - (a) Reduces sensitivity and increase gain
  - (b) Reduces sensitivity as well as gain
  - (c) Increases sensitivity as well as gain
  - (d) Increases sensitivity and reduces gain
  
5. The ECG is used to detect
  - (a) Heart attack
  - (b) Heart block
  - (c) Coronary of thrombosis
  - (d) All the above

#### PART B

1. The best definition for resolution is:
  - (a) The minimum distance between two objects that can be distinguished
  - (b) The magnification of a microscope
  - (c) The observed size divided by the actual size
  - (d) None of the above

2. In ionic bonds,  
(a) electrons are shared unequally between atoms (b) neutrons are transferred between atoms  
(c) protons are shared equally between atoms (d) electrons are transferred between atoms
3. The chemical properties of an atom are primarily determined by the number of  
(a) neutrons it has in its nucleus (b) isotopes it forms  
(c) protons it has in its nucleus (d) electrons it has in its outermost energy level
4. Ions involved in the conduction of nerve impulse is  
(a)  $\text{Na}^+$ ,  $\text{K}^+$  (b)  $\text{Na}^+$ ,  $\text{Ca}^{2+}$  (c)  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  (d)  $\text{K}^+$ ,  $\text{Mg}^{2+}$
5. Which is mismatched?  
(a) Cerebrum - memory (b) Medulla oblongata - temperature regulation  
(c) Cerebellum - equilibrium (d) Olfactory lobes - smell

## DEPARTMENT OF ENERGY

### M. Tech. in Energy Technology

#### Course Outline and Test pattern:

The final selection is based on written test. The test paper will include multiple choice questions covering (i) energy sources and energy conservation, (ii) mathematics, (iii) physics and (iv) chemistry (Graduate level courses in Science and Engineering).

There are 100 multiple-choice questions carrying one mark each for correct answer and **negative 0.25 mark for incorrect answer.**

#### Model questions:

- Which of the following is not associated with heat engine?  
(a) Carnot cycle      (b) Rankine cycle      (c) Otto cycle      (d) Calvin cycle
- Global warming is related to energy use because  
(a) fossil fuel burning releases CO<sub>2</sub>      (b) renewable energy sources causes harmful emission  
(c) fossil fuel sources are costly      (d) renewable sources of energy are not available
- In the following reaction, what is X  
$${}^9_4\text{Be}_5 + {}^4_2\text{He}_2 \longrightarrow {}^{12}_6\text{C}_6 + X$$
  
(a) a neutron      (b) a proton      (c) an alpha particle      (d) a deuteron
- The mass of a pencil is 10 grams. What is the equivalent mass energy in joules?  
(a)  $9 \times 10^{12}$  Joules      (b)  $9 \times 10^{13}$  Joules      (c)  $9 \times 10^{14}$  Joules      (d)  $9 \times 10^{15}$  Joules
- Find the value of **a** if the following matrix is singular  
$$\begin{pmatrix} -4 & 2 \\ 6 & a \end{pmatrix}$$
  
(a) 3      (b) 1/3      (c) 0      (d) -3
- Grignard reaction generally carried out in dry ether medium because  
(a) Ether is labile towards bases  
(b) Ether makes Mg more positive  
(c) Lone pair electrons from ether O destabilizes the Grignard reagent  
(d) Lone pair electrons from ether O stabilizes the Grignard reagent
- While measuring the conductance with a conductivity meter of cell constant 0.1cm<sup>-1</sup>, a 0.1 M HCl solution gave a conductance of 4 mS. The molar conductivity of the solution in Scm<sup>2</sup> mol<sup>-1</sup> is  
(a) 0.4      (b) 4      (c) 40      (d) 4000
- The time required to pass 36000 Coulomb of electricity through an electroplating bath using a current of 5A is  
(a) 0.5h      (b) 1h      (c) 1.5h      (d) 2h
- The oxidation number of oxygen in O<sub>2</sub>PtF<sub>6</sub> is  
(a) zero      (b) +½      (c) +1      (d) -½
- The differential equation  $(3x^2 + by \cos x) dx + (2 \sin x - 4y^3) dy = 0$  is exact for  
(a) b = 1      (b) b = 2      (c) b = 3      (d) b = 4



DEPARTMENT OF ENGLISH AND FOREIGN LANGUAGES

M.A. in English

**Course Outline and Test pattern:**

The entrance examination assesses whether the candidate has the level of knowledge and skills expected of a student who has graduated/is going to graduate with major/honours in English.

**Model questions:** (Note: The model question paper is indicative, not exhaustive)

**SECTION A (MULTIPLE CHOICE QUESTIONS)**

25×2=50

1. The Spanish Tragedy is important because it foreshadows Shakespeare's  
(a) King Lear (b) Hamlet (c) Macbeth (d) Othello
2. One of the University Wits who was killed in a tavern brawl at the age of 29 was  
(a) Kyd (b) Greene (c) Lyly (d) Marlowe
3. Who among the following wrote only tragedies?  
(a) Shakespeare (b) Thomas Kyd (c) Christopher Marlowe (d) Ben Jonson
4. "Good friend for Jesus's sake forebear To dig the dust enclosed here; Blest be the man that spares these stones, And curst be he that moves my bones". On whose tombstone are these lines inscribed?  
(a) Marlowe's (b) Sidney's (c) Shakespeare's (d) Milton's
5. "...the error of evaluating a poem by its effects – especially its emotional effects – upon the reader" is:  
(a) Affective Fallacy (b) Intentional Fallacy (c) Pathetic Fallacy (d) Effective Fallacy
6. Thomas Hardy's life and career are obliquely depicted in  
(a) The Return of the Native (b) Jude the Obscure  
(c) Tess of the d'Urbervilles (d) The Mayor of Casterbridge
7. Who of the following is known as the "father of the English essay"?  
(a) Ben Jonson (b) Francis Bacon (c) Addison and Steele (d) Dr. Johnson
8. The Chinese writer who won the Nobel Prize in 2012 is  
(a) Mo Yan (b) Han Suyin (c) Ba Jin (d) Mao Dun
9. The 2012 Booker Prize went to  
(a) Martin Amis (b) Hillary Mantel (c) Arvinda Adiga (d) Alice Munro
10. The meaning of **alliteration** is  
(a) how well a person can read, write, and speak  
(b) repeating first words of a sound in a series  
(c) speaking clearly or using the right words in writing  
(d) sounds in the words that are spelled like they sound
11. The meaning of **personification** is  
(a) the main character in the story (b) the person in the story is telling the story  
(c) giving lifelike qualities to inanimate objects (d) none of the above

12. The **plot** in a short story or novel is best described as  
 (a) the high point or turning point in the story (b) the events or action of the story  
 (c) the main tension or issue in the story (d) the brief encounter of extra characters  
 in the story
13. A **narrative** in literature is best described as  
 (a) a story that is told, written, or acted out (b) a time and place different than imagined  
 (c) a representation of something else (d) a point of interest or turning point
14. **Structure** for a story, novel, or poem is best described as  
 (a) the central message or insight in a literary work  
 (b) the main thoughts or themes in a literary work  
 (c) the time and place of the action in a literary work  
 (d) the pattern of organization in a literary piece
15. Every story has a **conflict** to resolve, and this is best described  
 (a) the tension, problem, or issue to be solved  
 (b) the high point of interest in the story  
 (c) the events or movement in the story  
 (d) the representation of other things in the story
16. Which phrase best describes what **theme** is in a story or poem?  
 (a) the time and place in which a story takes place  
 (b) the reason behind the writing of a story or poem  
 (c) the big ideas or central messages in a story or poem  
 (d) the imitation of a work of literature
17. Which social philosophy, dominant during the Industrial Revolution, dictated that only the free operation of economic laws would ensure the general welfare and that the government should not interfere in any person's pursuit of their personal interests?  
 (a) economic independence (b) the Rights of Man  
 (c) laissez-faire (d) enclosure
18. Who applied the term "Romantic" to the literary period dating from (roughly) 1785 to 1830?  
 (a) Wordsworth  
 (b) English historians half a century after the period ended  
 (c) Byron, Percy Shelley, and their followers  
 (d) Harold Bloom
19. Which poets collaborated on the Lyrical Ballads of 1798?  
 (a) Mary Wollstonecraft and William Blake  
 (b) Mary Wollstonecraft Shelley and Percy Bysshe Shelley  
 (c) William Wordsworth and Samuel Taylor Coleridge  
 (d) Charles Lamb and William Hazlitt
20. Which of the following best defines Utilitarianism?  
 (a) a farming technique aimed at maximizing productivity with the fewest tools  
 (b) a moral arithmetic, which states that all humans aim to maximize the greatest pleasure to the greatest number  
 (c) a critical methodology stating that all words have a single meaningful function within a given piece of literature  
 (d) a philosophy dictating that we should only keep what we use on a daily basis.

21. Which of the following discoveries, theories, and events contributed to Victorians feeling less like they were a uniquely special, central species in the universe and more isolated?  
 (a) geology (b) evolution  
 (c) discoveries in astronomy about stellar distances (d) all of the above
22. Which phrase indicates the interior flow of thought employed in modernist literature?  
 (a) automatic writing (b) free association (c) total recall (d) stream of consciousness
23. If we define postcolonialism as coming historically after the era of England's large-scale imperialism, who among the following is a postcolonial writer?  
 (a) Salman Rushdie (b) Joseph Conrad (c) Rabindranath Tagore (d) All of the above
24. What was the relationship between Victorian poets and the Romantics?  
 (a) The Romantics remained largely forgotten until their rediscovery by T. S. Eliot in the 1920s.  
 (b) The Romantics were seen as gifted but crude artists belonging to a distant, semi-barbarous age.  
 (c) The Victorians were strongly influenced by the Romantics and experienced a sense of belatedness.  
 (d) The Victorians were aware of no distinction between themselves and the Romantics; the distinction was only created by critics in the twentieth century.
25. Which best describes the imagist movement, exemplified in the work of T. E. Hulme and Ezra Pound?  
 (a) a poetic aesthetic vainly concerned with the way words appear on the page  
 (b) an effort to rid poetry of romantic fuzziness and facile emotionalism, replacing it with a precision and clarity of imagery  
 (c) an attention to alternate states of consciousness and uncanny imagery  
 (d) the resurrection of Romantic poetic sensibility

### SECTION B

26. Write a paragraph on any ONE of the following topics in not more than 200 words: 14  
 (a) a memorable journey (b) a funny incident (c) an autumn morning
27. Write an essay on any ONE of the following in not more than 300 words. 20  
 (a) Nature and literature (b) a modern novel (c) Fiction and life
28. Read the following poem and answer the questions that follow.

**I know why the caged bird sings**

A free bird leaps on the back  
 Of the wind and floats downstream  
 Till the current ends and dips his wing  
 In the orange sun's rays  
 And dares to claim the sky.

But a BIRD that stalks down his narrow cage  
 Can seldom see through his bars of rage  
 His wings are clipped and his feet are tied  
 So he opens his throat to sing.

The caged bird sings with a fearful trill  
Of things unknown but longed for still  
And his tune is heard on the distant hill for  
The caged bird sings of freedom.

The free bird thinks of another breeze  
And the trade winds soft through  
The sighing trees  
And the fat worms waiting on a dawn-bright  
Lawn and he names the sky his own.

But a caged BIRD stands on the grave of dreams  
His shadow shouts on a nightmare scream  
His wings are clipped and his feet are tied  
So he opens his throat to sing.

The caged bird sings with  
A fearful trill of things unknown  
But longed for still and his  
Tune is heard on the distant hill  
For the caged bird sings of freedom.

- (a) What is the theme of the poem? 2  
(b) How does the poet bring out the contrast between a free bird and a caged bird? 4  
(c) What does the sentence "And dares to claim the sky" mean in the poem? 2  
(d) Explain the meanings of the following expressions: 2x4=8  
(i) Bar of rage; (ii) fearful trill; (iii) sighing trees; (iv) grave of dreams

**Course Outline and Test pattern: (Updated and different from the printed version)**

The entrance examination tests whether the candidate has the basic information and ideas about languages of the world and how language as a phenomenon works.

There will be two parts in the question paper. Section A and Section B. Section A will contain 25 multiple choice questions of 2 marks each while Section B will contain descriptive questions of a total of 50 marks.

**Section A (Total Marks 2x25=50)**

*(The following sample questions are indicative, not exhaustive)*

**Find out the correct answer for question no. 1 to 10:**

2 x10 = 20

1. The following sub-fields of Linguistics deal with language in different contexts. Find out the odd pair from the following.  
(a) Sociolinguistics: Society and language  
(b) Computational linguistics: Computer science and language  
(c) Neurolinguistics: Language and brain  
(d) Psycholinguistics: Language and politics
2. The symbols used for writing any language are together called:  
(a) Logogram                      (b) Orthography                      (c) Script                      (d) Pictogram
3. Smallest units of sound used in language are:  
(a) Phonemes                      (b) Vowels                      (c) Consonants                      (d) Allophones
4. How many phonemes are there in the word height?  
(a) 3                      (b) 4                      (c) 6                      (d) 2
5. Smallest meaningful constituents of a word are:  
(a) Phonemes                      (b) Morphemes                      (c) Allophones                      (d) Allomorphs
6. What kind of morpheme is attached to the word boys?  
(a) Plural morpheme    (b) Past morpheme    (c) Negative morpheme    (d) Future morpheme
7. People from different parts of Assam speak Assamese differently. What is the term for this kind of variation?  
(a) Creole                      (b) Code-mixing                      (c) Dialect                      (d) Register
8. A multilingual person is one who  
(a) can speak or understand more than 1 language  
(b) can speak or understand more than 2 languages  
(c) can speak or understand more than 3 languages  
(d) can speak or understand more than 4 languages
9. A noun, e.g. dog, refers to a type of thing; on the other hand, a noun phrase, e.g. some big dogs, refers to  
(a) a kind of thing                      (b) one member of the type  
(c) a member or some members of the type                      (d) many members of the type

10. A transitive verb, e.g. tear, takes at least two participants, and they are:
- (a) Subject and Object
  - (b) Subject and Complement
  - (c) Complement and Object
  - (d) Subject and Adjective

**Section B (Total Marks: 50)**

*(The following sample questions are indicative, not exhaustive)*

11. The following words are from Michoacan Aztec (spoken in Mexico): 2x5 =10
- a. nokali 'my house'
  - b. mokali 'your house'
  - c. nokalimes 'my houses'
  - d. ipelo 'his dog'
  - e. ikali 'his house'
  - f. nokwahmili 'your cornfield'

Now consider the above data and construct the following words in Michoacan Aztec:

- (i) Your dogs    (ii) His cornfields    (iii) His dogs    (iv) My cornfields    (v) My dog

12. An action, which is denoted by a verb, is temporal: it is grounded either in the past, the present, or the future time. But sometimes we may think of an action outside time. Consider the following data and underline the verbs which are not grammatically grounded in any of the three times. 3 x 2 = 6

- (a) John likes to swim.
- (b) Once John liked to play football.

13. Explain the semantic difference between the two sentences below (write your answer in not more than 5 sentences). 4

- (i) I read this novel.
- (ii) I have read this novel.

14. Each of the following sentences has at least two meanings. Give both meanings for each of them. 3 x 2 = 6

- (i) The chicken is ready to eat.
- (ii) They are hunting dogs.
- (iii) The leopard was caught by the man with a rope.

15. Write short notes on any two of the following topics: 7 x 2 = 14

- (a) Competence and performance;
- (b) Synchronic and diachronic study of language;
- (c) Universal Grammar
- (d) Word and the world;
- (e) Structuralism;
- (f) Denotation and connotation;
- (g) Metaphor;
- (h) Speech acts;
- (i) Sense and reference



**Course Outline and Test pattern:**

The entrance test has two components. The first aims to test the candidate's general knowledge and the second their ability to write grammatically correct and acceptable English.

**Model questions:** (Note: The questions are indicative, not exhaustive)

**PART I**

1. Select the preposition in the sentence: **The pen is on the table.**  
(a) pen                      (b) is                      (c) on                      (d) table
2. Select the preposition in the sentence: **The book is behind the chair.**  
(a) book                      (b) behind                      (c) is                      (d) chair
3. Please select the best option to complete the following sentence: **There aren't \_\_\_\_\_ people here.**  
(a) much                      (b) many                      (c) a lot                      (d) some
4. Please select the best option to complete the following sentence: **I went to the shop \_\_\_\_\_ some chocolate.**  
(a) for buying                      (b) for buy                      (c) to buy                      (d) buy
5. Please select the best option to complete this sentence: **Would you mind \_\_\_\_\_ the window, please?**  
(a) to open                      (b) open                      (c) opening                      (d) I open
6. **Please select the best option to complete this sentence:** If he \_\_\_\_\_ worked harder, he would have passed the exams.  
(a) had have                      (b) would have                      (c) would                      (d) had
7. **Please select the best option to complete this sentence:** This dinner looks \_\_\_\_\_ to me.  
(a) well                      (b) nicely                      (c) badly                      (d) good
8. Who was the author of the famous storybook 'Alice's Adventures in Wonderland'?  
(a) Rudyard Kipling                      (b) John Keats                      (c) Lewis Carroll                      (d) H G Wells
9. How many lines does a sonnet have?  
(a) 10                      (b) 12                      (c) 14                      (d) They vary
10. Which is the first Harry Potter book?  
(a) Harry Potter and the Goblet of Fire                      (b) Harry Potter and the Philosopher's Stone  
(c) Harry Potter and the Chamber of Secrets                      (d) Harry Potter and the Deadly Hallows
11. Who wrote Wuthering Heights?  
(a) Emily Bronte                      (b) Charlotte Bronte                      (c) Jane Eyre                      (d) Jane Austen
12. What kind of book is Romeo and Juliet written by Shakespeare?  
(a) Poetry                      (b) A novel                      (c) A play                      (d) An essay
13. Who wrote War and Peace?  
(a) Fyodor Dostoyevsky                      (b) Nikolai Gogol                      (c) Valentin Rasputin                      (d) Leo Tolstoy



14. What is **theme**?
- (a) The main idea or message shown through a work of literature  
 (b) Traits of a character  
 (c) The author's view of a certain character  
 (d) all of the above
15. In the Jungle Book, who is the boy raised in the Indian forest by wolves?
- (a) Simba (b) Goha (c) Mowgli (d) Toto
16. How many Arabian Nights were there?
- (a)1001 (b)2001 (c) 101 (d)201
17. Which country is known as the Emerald Island?
- (a) Sri Lanka (b) Maldives (c) Mauritius (d) Australia
18. In which country is Ankor Vat situated?
- (a) Cambodia (b) Thailand (c) Malaysia (d) Myanmar
19. Who was the chairperson of the drafting committee for the Indian Constitution?
- (a) B R Ambedkar (b) Jawaharlal Nehru (c) Sarojini Naidu (d) Md. Saadullah
20. The Battle of Plassey was fought in
- (a) 1757 (b) 1748 (c) 1782 (d) 1764
21. Todar Mal was associated with
- (a) music (b) literature (c) land revenue reforms (d) law
22. Which city in India is known as the Pink City?
- (a) Jaipur (b) Delhi (c) Mysore (d) Mumbai
23. Which of the following is NOT written by Munshi Premchand?
- (a) Gaban (b) Godan (c) Guide (d) Manasorovar
24. In India the first television programme was broadcasted in
- (a)1959 (b) 1965 (c)1976 (d)1957
25. The famous book Anandmath was authored by
- (a) Sarojini Naidu (b) Bankim Chandra Chattopadhyay  
 (c) Sri Aurobindo (d) Rabindranath Tagore

## PART II

26. Precis writing. 10
27. Write a letter to the town authorities about the garbage in the market areas. 10
28. Construct a paragraph from the following leads: 10  
 Football match in town – people turn up to enjoy the game – eminent guest arrives – crowds settle with snacks – game begins – fierce competition on the field – sky looks gloomy – not enough shelter – people run helter skelter – match abandoned
29. Make sentences from any FIVE of the following given idioms 2×5=10
- (a) to bell the cat  
 (b) at a loss  
 (c) on the brain  
 (d) to eat humble pie  
 (e) at sixes and sevens  
 (f) like a bad penny
30. Write a composition (350-400 words) on the following: One night a burglar has been caught in your locality. Give a description of the incident and also the events that followed. 10

**One-year Certificate Course in Chinese (full time)**

**Course Outline and Test pattern:**

The entrance examination will assess the candidate's knowledge of English grammar and usage, ability to write coherent paragraphs in English and general information about China. The question paper consists of two sections; Section A (Objective Questions) and Section B (Subjective Questions).

**Model questions:** [*Important: The questions are indicative and not exhaustive*]

**SECTION A: OBJECTIVE QUESTIONS [50 marks]**

**Tick the correct options:**

1. Noun of STRONG –  
(a) STRONGER      (b) STRONGEST      (c) STRENGTH      (d) STRONGLY
2. Adjective of POVERTY –  
(a) POOR      (b) POVERT      (c) POVERTIVE      (d) POVERTIC
3. Verb of PRACTICAL –  
(a) PRACT      (b) PRACTIC      (c) PRACTICE      (d) PRACTICALITY
4. Adverb of BRIEF –  
(a) BRIEFING      (b) BRIEFINGLY      (c) BRIEFFULLY      (d) BRIEFLY
5. Opposite of TALL –  
(a) SORT      (b) SHORT      (c) SNORT      (d) DORT
6. Opposite of THIN –  
(a) CLICK      (b) LICK      (c) THICK      (d) TICK
7. Opposite of DRY –  
(a) BET      (b) SET      (c) PET      (d) WET
8. Opposite of NARROW –  
(a) WIDE      (b) PRIDE      (c) SIDE      (d) SLIDE
9. The opposite gender of BOY –  
(a) GIRL      (b) LADY      (c) LASS      (d) FEMALE
10. The opposite gender of KING –  
(a) DUTCHESS      (b) QUEEN      (c) SERVANT      (d) MAID
11. The opposite gender of LORD –  
(a) LORDESS      (b) LORDWOMAN      (c) LORDGIRL      (d) LADY
12. The opposite gender of HUSBAND –  
(a) PARTNER      (b) WOMAN      (c) WIFE      (d) COUPLE
13. The opposite gender of DAUGHTER –  
(a) FATHER      (b) MOTHER      (c) BROTHER      (d) SON
14. Does he still \_\_\_\_\_ to the football club?  
(a) Belong      (b) Belongs      (c) Has belong      (d) Have belong

15. We never \_\_\_\_\_ him anymore.  
 (a) Seeing (b) Hassee (c) See (d) Seen
16. She \_\_\_\_\_ games after study.  
 (a) Play (b) Plays (c) Playing (d) To play
17. All work and no \_\_\_\_\_ makes Jack a dull boy.  
 (a) Toy (b) Joy (c) Holiday (d) Play
18. Birds of a \_\_\_\_\_ flock together.  
 (a) Mother (b) Feather (c) Colour (d) Nature
19. The staple food of the Chinese people is –  
 (a) NOODLES (b) RICE (c) WHEAT (d) SPHAGETTI
20. The People’s Republic of China was founded in the year –  
 (a) 1946 (b) 1947 (c) 1948 (d) 1949
21. The capital of China is –  
 (a) Tokyo (b) Beijing (c) Pyongyang (d) Laos
22. China got back Hongkong in –  
 (a) 1979 (b) 1797 (c) 1997 (d) 1779
23. Which country did China attack in 1962?  
 (a) Japan (b) India (c) USSR (d) Sri Lanka
24. This river is also known as the “Sorrow of China” –  
 (a) The Red River (b) The Blue River (c) The Green River (d) The Yellow River
25. One of the Seven Wonders of the World in China is –  
 (a) The Great Road (b) The Great Wall (c) The Great Pagoda (d) The Great Palace

**SECTION B: SUBJECTIVE QUESTIONS [50 marks]**

1. Write a letter (in not more than 300 words) - 20  
 To your friend abroad describing an Indian festival you are fond of.  
**OR**  
 To your father/mother explaining why you want to learn a foreign language.  
**OR**  
 To the editor of a newspaper about the problems of blindly imitating the West.
2. Write an essay (in not more than 300 words) on any one of the following: 20  
 (a) Environmental pollution (b) Globalization and India  
 (c) National integration (d) The role of media in the Indian society
3. Read the following text carefully and answer the questions given below: 10  
 It is a matter of common knowledge that in underdeveloped countries such as India with a growing population, there is an unusual pressure on land cultivation. Here, more people are engaged in agriculture partly or wholly than are necessary.  
 What is the result? When more people are engaged in agriculture than are really needed for the purpose, they are really surplus. If they are withdrawn from the rural areas and put in other occupations and professions it will not mean any decrease in agricultural output. On the other hand, it might increase, as it is said, “Too many cooks spoil the broth”. In absolute terms

the total volume of rural unemployment is much larger than that of any other country. No wonder, it poses the most challenging problem for the planners to tackle.

(a) Suggest a suitable title for the text. 2

(b) In which literary category would you classify the text- 2

- (i) A report      (ii) A story      (iii) An advertisement      (iv) An essay

(c) Complete the following sentence with words or phrases that best suit the context. Choose from the alternative suggested: 3×2=6

[ I ] In India there are many more people engaged in land cultivation than are-

(i) demanded

(ii) needed

(iii) expected

[ II ] "They are really surplus" means-

(i) there are too many of them

(ii) they are really useless

(iii) they are really needed

[ III ] India has the largest number of-

(i) unemployed persons in the urban areas

(ii) unemployed persons in the village areas

(iii) unemployed persons in the planning department

DEPARTMENT OF ENVIRONMENTAL SCIENCE

M.Sc. in Environmental Science

**Course Outline and Test pattern:**

The test paper shall have multiple choice type questions of 10+2 and under graduate level science.

**Model questions:**

1. Condensation is a process which occurs when
  - (a) temperature falls below  $0^{\circ}\text{C}$
  - (b) absolute humidity becomes equal to relative humidity
  - (c) temperature in the air parcel remains static
  - (d) relative humidity becomes 100%
2. A black body emits:
  - (a) Radiation of all wave lengths
  - (b) no radiations
  - (c) radiations of only one wavelength
  - (d) radiations of selected wavelengths
3. Wind changes its direction due to:
  - (a) coriolis force
  - (b) density differences
  - (c) frictional drag of winds
  - (d) all of the above
4. The isotope of carbon used in radio carbon dating is
  - (a)  $^{12}\text{C}$
  - (b)  $^{13}\text{C}$
  - (c)  $^{14}\text{C}$
  - (d)  $^{15}\text{C}$
5. For a process to be spontaneous
  - (a)  $\Delta G$  must be -ve
  - (b)  $\Delta G$  should be +ve
  - (c)  $\Delta H$  must be -ve
  - (d)  $\Delta S$  must be -ve
6. Stomata of a plant open due to
  - (a) Influx of potassium ions
  - (b) Efflux of potassium ions
  - (c) Influx of hydrogen ions
  - (d) Influx of calcium ions
7. Which of the following is non symbiotic biofertilizer?
  - (a) Anabaena
  - (b) Rhizobium
  - (c) VAM
  - (d) Azotobacter
8. Which group of vertebrates comprises the highest number of endangered species?
  - (a) Mammals
  - (b) Fishes
  - (c) Reptiles
  - (d) Birds
9. In short day plants, flowering is induced by
  - (a) Photoperiod less than 12 hours
  - (b) Photoperiod below a critical length and uninterrupted long night
  - (c) Long night
  - (d) Short photoperiod and long night
10. Itaiitai disease is caused due to poisoning of
  - (a) Zn,
  - (b) Pb
  - (c) Cd
  - (d) As

**DEPARTMENT OF FOOD ENGINEERING AND TECHNOLOGY**

**Post B. Sc. Integrated M. Tech. in Food Engineering and Technology**

**Course Outline and Test pattern:**

The test paper shall contain 100 objective type questions from 10+2 Mathematics (30%), Physics (20%) and Chemistry (20%) and General Knowledge & Aptitude (30%). Selection will be based on Total Marks secured in TUEE.

**Model questions:**

**Section A**

1. The term independent of x in the expansion of  $(x^2+1/x)^{12}$  is  
(a) 120                      (b) 285                      (c) 495                      (d) 595
2. General form of equation of a line is  
(a)  $ax+by+c=0$               (b)  $ax+by-c=0$               (c)  $ax-by+c=0$               (d)  $ax-by-c=0$
3. A variable whose values depend on the outcomes of random experiment is called  
(a) Constant              (b) parameter              (c) statistic              (d) random variable

**Section B**

1. One kilowatt hour is equal to  
(a)  $36 \times 10^{-5}$  J              (b)  $36 \times 10^{-3}$  J              (c)  $36 \times 10^3$  J              (d)  $36 \times 10^5$  J
2. The amount of heat required to melt one kg of ice at  $0^\circ\text{C}$  is called  
(a) Heat of vaporization              (b) heat capacity  
(c) Latent heat of fusion              (d) none of these
3. Moment of inertia is measured in  
(a)  $\text{Kg m}^{-3}$               (b)  $\text{Kg m}^{-2}$               (c) N.S              (d) red/sec

**Section C**

1. Which salt dissolved in water forms a solution with a pH greater than 7  
(a) NaCl              (b)  $\text{CuSO}_4$               (c)  $\text{Na}_2\text{CO}_3$               (d)  $\text{NH}_4\text{Cl}$
2. The reaction between fat and NaOH is called  
(a) esterification              (b) saponification              (c) hydrogenolysis              (d) fermentation
3. Changing the number of neutrons of an atom changes its:  
(a) isotope              (b) element              (c) ion              (d) charge

**Section D**

1. Pickles can be preserved by -----  
(a) Salt              (b) Sugar              (c) Vineger              (d) All of the above
2. Vitamin C is also otherwise known as  
(a) Citric Acid              (b) Ascorbic Acid              (c) Formic Acid              (d) Acetic acid
3. Among the following shape which is having minimum surface area  
(a) Square              (b) Circle              (c) Triangle              (d) Rectangle

## M. Tech. in Food Engineering and Technology

### Course Outline and Test pattern:

The test paper shall contain 100 objective type questions covering the subjects of mathematics (20%), General Engineering (30%) and Food Engineering and Technology (50%). Selection will be based on Total Marks secured in TUEE.

However, if the candidate claims admission based on a valid GATE score, following criteria will be used:

- i) For GATE holder with food technology as one of the optional subjects:  
GATE Score (70% weightage) + Personal Interview (30% weightage)
- ii) For GATE holder without food technology as one of the optional subjects :  
GATE score (70% weightage) + TUEE marks (30% weightage)

The final selection will be based on written test, group discussion /personal interview.

### Model questions:

#### Section A

The function  $f$  satisfies the equation  $f(x) = \operatorname{cosec} x$ . Evaluate  $f(\pi/3)$ .

- (a) 1                                      (b) 1.366                                      (c) 2.732                                      (d) 2

2. Give the minimum value of the function  $f(x) = 2x^3 - 9x + 5$  for  $x \geq 0$ .

- (a) -2.258                                      (b) -2.368                                      (c) -2.349                                      (d) -2.213

3. A fair coin is thrown in the air four times. If the coin lands with the head up on the first three tosses, what is the probability that the coin will land with the head up on the fourth toss?

- (a) 0                                      (b) 1/16                                      (c) 1/8                                      (d) 1/2

#### Section B

1. The velocity head in a pipe system is

- (a)  $Z$                                       (b)  $V$                                       (c)  $\frac{V^2}{2g}$                                       (d)  $\sqrt{2g \frac{P}{\gamma}}$

2. Which of the following statements is always true for a reaction in which there is no non-expansion work?

- (a)  $\Delta U = q_p$                                       (b)  $\Delta H = q_p$                                       (c)  $\Delta U = 0$                                       (d)  $\Delta H = 0$

3. Time dependent permanent deformation is called

- (a) Plastic deformation                                      (b) Elastic deformation                                      (c) Creep                                      (d) Inelastic deformation

#### Section C

1. Complex carbohydrates are polymers of

- (a) amino acids                                      (b) nucleic acids                                      (c) fatty acids                                      (d) glucose

2. How much heat is required to melt the ice?

- (a) 16J                                      (b)  $1.6 \times 10^5$  J                                      (c)  $4.5 \times 10^6$  J                                      (d) 1080J

3. What is the **S** value of a heat treatment process if the microbial concentration gets reduced from  $10^9$  cfu/ml to 1 cfu/ml ?

- (a) 10<sup>9</sup>                                      (b) 10                                      (c) 9                                      (d) 1

DEPARTMENT OF HINDI (हिंदी विभाग)

M.A. in Hindi

**Course Outline and Test pattern:**

The entrance examination for M.A. in Hindi assesses whether the candidate has the level of knowledge and skills expected of a student who has graduated or is going to graduate with major/honours in Hindi.

There will be 100 marks for the test. The written test shall include multiple choice objective type questions of 50 marks. Descriptive type questions shall consist of the remaining fifty marks.

**Model questions:**

1. निम्नलिखित प्रश्नों के उत्तर दीजिए:

2x25=50

I. हिंदी के प्रमुख भेद हैं :

- (a) चार (b) दो (c) सात (d) छः

II. हिंदी को राष्ट्रभाषा के रूप में कब मान्यता प्रदान की गई ?

- (a) 5 सितंबर 1948 (b) 26 जनवरी 1965  
(c) 14 सितंबर 1949 (d) 20 जनवरी 1949

III. हिंदी भाषा का वास्तविक आरंभ माना जाता है ?

- (a) नवीं सदी (b) ग्यारहवीं सदी  
(c) बारहवीं सदी (d) दसवीं सदी

IV. हिंदी साहित्य का पहला इतिहास किस भाषा में लिखा गया ?

- (a) अंग्रेजी (b) फ्रेंच  
(c) उर्दू (d) पुर्तगाली

V. भक्तिकाल की सही समयावधि है:

- (a) 1375-1700 (b) 1400-1650  
(c) 1376-1716 (d) 1385-1800

2. किन्हीं तीन प्रश्नों के उत्तर दीजिए

3x10=30

1. आदिकाल के नामकरण की समस्या पर विचार कीजिए ।
2. भक्तिकाल के उद्भव एवं विकास पर एक निबंध लिखिए ।
3. रीतिकालीन काव्यधाराओं की चर्चा करते हुए उनके प्रमुख कवियों के नाम बताइए ।
4. हिंदी साहित्य के विकास में साहित्यिक पत्रिकाओं के योगदान पर विचार कीजिए ।

3. किन्हीं चार प्रश्नों के उत्तर दीजिए

5x4=20

1. 'अष्टछाप' का परिचय देते हुए उसके प्रमुख कवियों के नाम बताइए ।
2. सगुण और निर्गुण के अंतर को स्पष्ट कीजिए ।
3. 'गोदान' की मूल भाव संवेदना पर प्रकाश डालिए ।
4. 'काव्य-प्रयोजन' के स्वरूप को स्पष्ट कीजिए ।
5. 'काव्य-हेतु' से क्या तात्पर्य है?
6. प्रगतिवादी काव्य की मुख्य प्रवृत्तियाँ बताइए ।



**Post Graduate Diploma in Translation (PGDT) Hindi**

**Course Outline and Test pattern:**

The written test shall have both objective and descriptive type of questions based on degree level syllabus of Hindi major, electives, praveen and sahityaratna.

**Model questions:**

1. निम्नलिखित प्रश्नों के उत्तर दीजिए 2x25=50
- I. आचार्य भरतमुनि के अनुसार रस के कितने प्रकार होते हैं ?
- (a) दो (b) चार  
(c) छः (d) आठ
- II. हिंदी के उपन्यास सम्राट कौन है ?
- (a) प्रेमचंद (b) जयशंकर प्रसाद  
(c) भारतेन्दु हरिश्चंद्र (d) वृंदावनलाल वर्मा
- III. हिंदी दिवस कब मनाया जाता है ?
- (a) 14 अक्टूबर (b) 14 सितंबर  
(c) 14 दिसंबर (d) 14 नवंबर
- IV. भारतीय संविधान की आठवीं अनुसूची में कितनी भाषाएँ शामिल हैं ?
- (a) 16 (b) 18  
(c) 2 (d) 22
2. निम्नलिखित प्रश्नों के संक्षिप्त उत्तर दीजिए 5x4=20
- बिहारी हिंदी की बोलियों का संक्षिप्त परिचय दीजिए ।  
राजभाषा और राष्ट्रभाषा के अंतर को समझाइए ।  
कार्यालयी हिंदी किसे कहते हैं ?  
असम राष्ट्रभाषा प्रचार समिति का परिचय दीजिए ।
3. अनुवाद कीजिए - 1x10=10
- अंग्रेजी से हिंदी में अथवा हिंदी से अंग्रेजी में ।
4. किन्हीं दो प्रश्नों के उत्तर दीजिए- 2x10=20
- I. हिंदी भाषा की संवैधानिक स्थिति का उल्लेख कीजिए ।  
II. हिंदी साहित्य के कालविभाजन पर प्रकाश डालिए ।  
III. हिंदी भाषा के उद्भव एवं विकास को स्पष्ट कीजिए ।

## DEPARTMENT OF MASS COMMUNICATION AND JOURNALISM

### M.A. in Mass Communication and Journalism

#### Course Outline and Test pattern:

The written test shall comprise of both objective and subjective questions. The objective questions consist of current affairs, general knowledge, English language, general awareness on Northeast India and the basics of mass media. The subjective section is to test the candidate's writing skills, creative and analytical capabilities. The final selection will be based on written test, group discussion and personal interview.

#### Model questions:

- The Admission Test Booklet has been designed to test your knowledge in the English language, general knowledge, current affairs, media, culture and tradition of North East India, etc. Questions on general knowledge, current affairs and media might be on the following lines:
  1. 'Folio' is the supplement of which newspaper:  
(a) The Hindu (b) The Statesman (c) Assam Tribune (d) The Telegraph
  2. Which news channel of North-East recently launched the entertainment channel 'Rang'?  
(a) DY365 (b) Newslive (c) NETV (d) Doordarshan
  3. Who is the Chief Minister of Sikkim?  
(a) Pawan Chamling (b) Mukut Mithi (c) Tarun Gogoi (d) None of these
  4. In which year did AR Rahman win the Oscar for best music direction?  
(a) 2009 (b) 2008 (c) 2007 (d) 2006
  5. Life ho to Aisi is the advertising slogan of which of the following  
(a) Coca-Cola (b) Pepsi (c) Thums Up (d) LIMCA
  6. For many years, Neighbour's Envy, Owner's Pride was the advertising catchline of which of the following?  
(a) PHILIPS TV (b) ONIDA TV (c) BPL TV (d) LG TV
- There will be passages and questions following them. You will have to read the passages thoroughly and then answer the questions.
- There will be some questions on synonyms and antonyms.
- There will be some questions with jumbled sentences. You will have to rearrange the jumbled parts into a meaningful sentence. For example:
  7. Women  
(P) are more likely to give birth prematurely  
(Q) and their babies are at increased risk  
(R) who are poorly nourished or sick  
(S) of death and disability  
(a) RQSP (b) RPQS (c) QSPR (d) QSRP [Ans: (b)]
- Some idioms or phrases might also be given and you will have to choose the right option for the correct meaning of the phrase.
- There will also be short answer type questions
- 8. 'Young India' was edited by \_\_\_\_\_
- 9. Nogkrem is a folk dance form in the state of \_\_\_\_\_
  - Besides the above, you will be asked to write Essays / Features on a contemporary issue or a theme OR a feature by taking clues from a photograph. This is to test your perception, vocabulary, expression, style of writing, presentation, creativity and analytical skills etc.
- 10. Violence in the society is becoming more and more crude and gory. Are media acting as 'fueler' or spoiler of violence? Discuss.

**PG Diploma in Mobile and Multimedia Communication**

**Course Outline and Test pattern:**

The written test shall comprise of both objective and subjective type questions. The objective questions will consist of tests on English Language, General Knowledge, Computer Knowledge, Current Affairs, Culture and Traditions of North East India. The subjective questions are to test the candidates' sensitivity towards social issues and writing skills. The final selection will be based on the written test and personal interview.

**Model questions:**

- The Admission Test Booklet has been designed to test your knowledge on English language, general knowledge, computer knowledge, current affairs, media, culture and tradition of North East India etc.
- There will be passages, and questions following them. You will have to read the passages thoroughly and then answer the questions.
- There will be some questions on synonyms and antonyms.
- Some idioms or phrases might also be given and you will have to choose the right option for the correct meaning of the phrase.
- Questions on general knowledge, computer, current affairs and media might be on the following lines:

A. Find the suitable answer from among the choices

1. IPCC means

- (a) Indian Penal for Climate Change
- (b) Intergovernmental Panel on Climate change
- (c) International public and Climate change on any two
- (d) Indian People and Climate change

2. Name of the union minister for Information and Broadcasting

- (a) Mr. Jay Ram Ramesh
- (b) Ms. Renuka Chaudhery
- (C) Ms. Ambika Soni
- (d) Mr. Manish Tiwari

- There will be short answer type questions

A. "Rangmilir Hanhi" was written by.....

B. Oja Pali is a folk dance form in the state of .....

- Besides the above, you will be asked to write essays. This is to test your perceptions, vocabulary, expression, style of writing, presentation, creativity and analytical skills etc.

Write an essay not exceeding 500 words on any one of the following topics.

- (a) National Rural Employment Guarantee Scheme.
- (b) Role of Media in Youth Empowerment
- (c) Effects of Global Warming.

**DEPARTMENT OF MATHEMATICAL SCIENCES**

**M.A. / M.Sc. in Mathematics**

**Course Outline and Test pattern:**

Questions will be of objective type of Graduate level Mathematics. Each question carries 2 marks and **0.5 marks will be deducted for each wrong answer.**

**Model questions:**

**Choose the correct alternative**

- Let  $X$  be a subset of  $R$ , the set of all real numbers. What does it mean for  $x$  to be a limit point of  $X$ ?
  - Every sequence  $x_1, x_2, x_3, \dots$  which converges to  $x$ , must lie in  $X$ .
  - There exists a sequence  $x_1, x_2, x_3, \dots$  in  $X - \{x\}$  which converges to  $x$ .
  - There exists a sequence  $x_1, x_2, x_3, \dots$  in  $X$  which converges to  $x$ .
  - Every sequence  $x_1, x_2, x_3, \dots$  which converges to  $x$ , must lie in  $X - \{x\}$ .
- If  $f$  is bounded and integrable on  $[a, b]$ , then which of the following is most appropriate
  - $|f|$  is bounded and integrable.
  - $|f|$  is bounded but may not be integrable.
  - $\left| \int_a^b f dx \right| \leq \int_a^b |f| dx$
  - $\int_a^b |f| dx \leq \left| \int_a^b f dx \right|$
- Given the harmonic function  $u = x^3 - 3xy^2$ , the corresponding analytic function is
  - $3z^2$
  - $z^2$
  - $3z^3$
  - $z^3$
- Consider the system of linear equations  $x + y + z = 1$ ,  $x + 2y - z = 2$ ,  $3x + 4y + kz = 4$  then,
  - if  $k = 1$  the system has no solution
  - if  $k = 1$  the system has unique solution.
  - if  $k = 1$  the system has infinite solution
  - if  $k \neq 1$  the system has infinite solution.
- Under the influence of a force field  $\vec{F}$ , a particle of mass ' $m$ ' moves along the ellipse  $\vec{r} = a \cos \omega t \hat{i} + b \sin \omega t \hat{j}$ . Then  $\vec{r} \times \vec{F}$  is
  - 0
  - $m\omega^2(a^2 \cos^2 \omega t + b^2 \sin^2 \omega t) \hat{k}$
  - $m\omega^2(a^2 + b^2) \cos \omega t \sin \omega t \hat{k}$
  - $ma^2 \omega^2 \hat{k}$
- The solution of the differential equation  $y' - y = e^{2x}$  is
  - $e^x + ce^{2x}$
  - $e^{-x} + ce^{2x}$
  - $e^{-2x} + ce^x$
  - $e^{2x} + ce^x$
- Factory A supplied 5 bulbs, 1 of which was defective. Factory B supplied 4 bulbs, 2 of which were defective. 1 bulb is to be chosen uniformly at random from the 9 bulbs supplied by the factories. If the chosen bulb is found to be defective, what is the probability that the bulb was supplied by factory B?
  - $\frac{4}{9}$
  - $\frac{5}{9}$
  - $\frac{2}{3}$
  - $\frac{5}{7}$
- Consider the permutations  $f = (123)(12)$ ,  $g = (12345)(123)(45)$  then
  - Both  $f$  and  $g$  are even
  - Both  $f$  and  $g$  are odd
  - $f$  is odd and  $g$  is even
  - $f$  is even and  $g$  is odd

## Integrated M.Sc. and B.Sc. B. Ed. in Mathematics

### Course Outline and Test pattern:

Test comprising of 50 objective type questions in two sections. The first section shall contain 35 questions in Mathematics and the second section shall contain 15 questions from Biology, Chemistry, Physics & General. Each question carries 2 marks and **0.5 marks will be deducted for each wrong answer.**

### Model questions:

#### Section A: Mathematics

Choose the correct alternative

1. If,  $f(x) = \int_{-1}^1 |t| dt$  then  $f'(x)$  is  
(a) 0                      (b) 2                      (c)  $|x|$                       (d)  $2|x|$ .
2. The area lying in the first quadrant and bounded by  $x^2 + y^2 = 4$  and the lines  $x = 0$  and  $x = 2$   
(a)  $\pi$                       (b)  $\pi/2$                       (c)  $\pi/3$                       (d)  $\pi/4$
3. The number of possible ways in selecting a committee of two members out of 3 men and 2 women is  
(a) 10                      (b) 25                      (c) 100                      (d) 120.
4. Let  $p(x) = x^2 + bx + c$  with  $b$  and  $c$  both integers. If the two roots of  $p(x) = 0$  are identical, which of the following statements need not be true?  
(a)  $c$  is a perfect square                      (b)  $1 + b + c$  is a perfect square  
(c)  $1 - b + c$  is a perfect square                      (d)  $1 + b - c$  is a perfect square.
5. Consider the graph of the curve  $y = \sin(x - 5) + 5$ . At how many points will this curve intersect the  $x$ -axis?  
(a) 0                      (b) 1                      (c) 5                      (d)  $\infty$ .
6. In a triangle  $ABC$ ,  $a = 4$ ,  $b = 3$ ,  $A = 60^\circ$  then  $c$  is a root of the equation  
(a)  $c^2 - 3c - 7 = 0$                       (b)  $c^2 + 3c + 7 = 0$   
(c)  $c^2 - 3c + 7 = 0$                       (d)  $c^2 + 3c - 7 = 0$
7. The probability that a leap year will have 53 Fridays or 53 Saturdays is  
(a)  $\frac{2}{7}$                       (b)  $\frac{3}{7}$                       (c)  $\frac{4}{7}$                       (d)  $\frac{1}{7}$
8. The function  $f(x) = 2x^3 - 3x^2 - 12x + 4$  has  
(a) no maxima or minima                      (b) one maxima and one minima  
(c) two maxima                      (d) two minima
9. The straight line whose sum of the intercepts on the axes is equal to half of the product of the intercepts, passes through the point  
(a) **(1,1)**                      (b) **(2,2)**                      (c) **(3,3)**                      (d) **(4,4)**
10. If  $\mathbf{a}$  and  $\mathbf{b}$  are two unit vectors such that angle between them is  $60^\circ$ , then  $|\mathbf{a}-\mathbf{b}|$  is equal to  
(a)  $\sqrt{5}$                       (b)  $\sqrt{3}$                       (c) 0                      (d) 1

#### Section B: Physics/Chemistry/Biology/General

This section shall contain 15 multiple choice questions from Physics, Chemistry, Biology and General.

**DEPARTMENT OF MECHANICAL ENGINEERING**

**M.Tech. in Mechanical Engineering (Specialization: Applied Mechanics)**

**Course Outline and Test pattern:**

The written test consists of two sections: (A) Solid Mechanics and (B) Fluid Mechanics. Each section contains 50 (fifty) multiple-choice questions carrying one mark per question. There may be a personal interview also if the number of candidates is large.

**Model questions :**

**SECTION-A (Solid Mechanics)**

1. A mild steel specimen is tested under tension and a continuous graph between load and extension is plotted. A load at which there is considerable extension without increase in resistance is called  
(a) Ultimate load      (b) upper yield point      (c) Lower yield point      (d) breaking load
2. The variation of hoop stress across the thickness of thick cylinder is  
(a) Linear      (b) uniform      (c) Parabolic      (d) none of the above
3. The most common ways of keeping the beam of uniform strength by  
(a) Keeping the width uniform and varying the depth  
(b) Keeping the depth uniform and varying the width  
(c) Varying both width and depth  
(d) None of the above
4. A beam of length 'L' carries a load 'W' at its middle. If the slope at the middle of cantilever is 'θ', then slope at the free end is  
(a) 0.5θ      (b) θ      (c) 1.5θ      (d) 2θ
5. A strut of length 'L' is fixed at one end and free at the other. The Euler's buckling load for this strut is 10 KN. If both the ends of the strut are now fixed, what will be its Euler's buckling load  
(a) 160 KN      (b) 120 KN      (c) 60 KN      (d) 5 KN

**SECTION-B: (Fluid Mechanics)**

1. Continuity equation for a steady flow states that  
(a) Velocity field is continuous at all points in flow field  
(b) The velocity is tangential to the streamlines  
(c) The stream function exists for steady flows  
(d) The efflux rate of mass through the control surfaces is zero.
2. In a two dimensional flow in x-y plane, if  $\frac{\partial u}{\partial y} = \frac{\partial v}{\partial x}$  then the fluid element will undergo  
(a) Translation only      (b) Translation and rotation  
(c) Translation and deformation      (d) Rotation and deformation
3. Which of the following is not a dimensionless group?  
(a)  $\frac{\Delta p}{\rho N^2 D^2}$       (b)  $\frac{g H}{N^2 D^2}$       (c)  $\frac{\rho \omega D^2}{\mu}$       (d)  $\frac{\Delta p}{\rho V^3}$
4. The expression  $(p + \gamma z + \frac{\rho V^2}{2})$  commonly used to express Bernoulli's equation, has units of  
(a) Total energy per unit mass      (b) Total energy per unit weight  
(c) Total energy per unit volume      (d) Total energy per unit cross sectional area of flow
5. The Euler equation of motion for the flow for an ideal fluid is derived considering the principle of conservation of  
(a) Mass and the fluid as incompressible and inviscid  
(b) Momentum and the fluid as incompressible and viscous  
(c) Momentum and the fluid as incompressible and inviscid  
(d) Energy and the fluid as incompressible and inviscid

## DEPARTMENT OF MOLECULAR BIOLOGY AND BIOTECHNOLOGY

### M.Sc. in Molecular Biology and Biotechnology

#### Course Outline and Test pattern:(Updated and different from the printed version)

The entrance examination is held for 10 seats (out of 30 seats) reserved for the domicile of North East India. **There shall be only multiple choice type questions.** The booklet will have questions on higher secondary level Chemistry, Physics and Mathematics and graduate level Life Science subjects.

**Note:** Test comprises of 50 questions. Two (02) marks will be awarded for each correct answer and **0.5 mark will be deducted for each wrong answer.**

#### Model questions:

- The work done when one mole of an ideal gas expand freely into vacuum  
(a)  $-P\Delta V$  (b)  $P\Delta V$  (c)  $\Delta G$  (d) Zero
- Which of the following solid is a better conductor of electricity?  
(a) Pure NaCl crystals (b) Diamond (c) Graphite (d) Marble pieces
- A man walks along a rectangle whose perimeter is six kms. If the area of the rectangle is two sq.kms, what is the difference between the length and breadth of the rectangle?  
(a)  $\frac{1}{2}$  km (b) 1 km (c)  $1\frac{1}{2}$  km (d) 2 km
- Insulin is secreted by  
(a)  $\beta$ -cells of pancreas (b)  $\alpha$ -cells of pancreas (c)  $\delta$ -cells of pancreas (d) liver cells
- The deficiency of the following Vitamin causes reproduction failure in animals  
(a) Vitamin A (b) Vitamin B (c) Vitamin D (d) Vitamin E
- Two different objects of same mass but of different volumes are put in a bucket full of water. Both the objects float in water. The amount of water is being displaced by each of the two objects are  
(a) Both the objects displace equal amount water  
(b) The object with lesser volume displaces more water  
(c) The object with higher volume displaces more water  
(d) The object with higher density displaces more water
- A dried coconut fell from a coconut tree of 500 metre height. After how much time the coconut will hit the ground (consider  $g = 10 \text{ m/sec}^2$ )  
(a) 10 sec (b) 50 sec (c) 100 sec (d) 30 sec
- Nucleic acids are digested in which part of human alimentary canal  
(a) Mouth (b) Stomach (c) Small intestine (d) Large intestine
- Bacteria belongs to which of the following genus are found in diverse ecological niches  
(a) Pseudomonas (b) Mycobacterium (c) Salmonella (d) Yersinia
- Organism capable of both nitrogen fixation and photosynthesis belong to  
(a) High plants (b) Fungi (c) Bacteria (d) Euglena

## Integrated M.Sc. in Bioscience and Bioinformatics

### Course Outline and Test pattern:

Test comprising of 50 objective type questions in two sections. The first section shall contain 35 questions in Biology and the second section shall contain 15 questions from Mathematics, Chemistry, Physics & General. Each question carries 2 marks and **0.5 marks will be deducted for each wrong answer.**

### Model questions:

1. Sarcoplasm is the cytoplasm of  
(a) Nerve fibres (b) Muscle fibres  
(c) Both a and b (d) None of these
2. The cruciform loops of DNA contains  
(a) Satellite DNA (b) Palindromic DNA  
(c) Single stranded DNA (d) Z-DNA
3. Which of the following is an example of steroid hormone?  
(a) Adrenaline (b) Corticotrophin  
(c) Insulin (d) Testosterone
4. Kupffer's cells are  
(a) Phagocytic (b) Actin  
(c) Myosin (d) Fibrin
5. \_\_\_\_\_ is a parasitic algae  
(a) Cephaleuros (b) Ulothrix  
(c) Odogonium (d) Sargassum
6. The percentage of oxygen present in air inhaled by humans is  
(a) 21% (b) 78%  
(c) 1% (d) 43.5%
7. The zoological name for the Java man is  
(a) Homo erectus (b) Homo habilis  
(c) Homo sapiens (d) Australopithecus
8. DNA was first discovered as "nuclein" by  
(a) Meischer (b) Koch  
(c) Fleming (d) Watson
9. The *Trp* operon is a  
(a) repressible system (b) inducible system  
(c) system controlled by 3 structural genes (d) All of the above
10. The Moss capsule represents  
(a) Sporophyte (b) Gametophyte  
(c) Sorus (d) Gametophore



## DEPARTMENT OF PHYSICS

### M.Sc. in Physics

#### Course Outline and Test pattern:

Upto B.Sc. Physics (Honours) syllabus. The paper is of objective type.

Entrance test has 50 objective type questions. Each question carries 2 marks. **For every incorrect answer 0.5 marks will be deducted.**

#### Model questions:

- If the other parameters are same, the range of a projectile is maximum when its angle of projection is  
(a) 90° (b) 60° (c) 45° (d) 30°
- Hamiltonian formalism is easier to handle than Lagrangian formalism because Hamiltonian formalism involves  
(a) first order differential equations (b) only Cartesian co-ordinates  
(c) generalized momentum instead of generalized co-ordinates (d) no time derivatives
- An electric potential field is produced by joint charges 1 mC and 4 mC located at (-2, 1, 5) and (1, 3, -1) respectively. The energy stored in the field is  
(a) 2.57 mJ, (b) 5.14 mJ, (c) 0.28 mJ (d) 20.56 mJ
- Which of the following potentials does not satisfy the Laplace's equation?  
(a)  $V = 2x + 5$  (b)  $V = 10xy$  (c)  $V = x^2y^2 + 5x + 2$  (d)  $V = 3y + 10$
- Three perfect gases at absolute temperatures  $T_1$ ,  $T_2$  and  $T_3$  are mixed. The masses of molecules are  $m_1$ ,  $m_2$  and  $m_3$  and the number of molecules are  $n_1$ ,  $n_2$  and  $n_3$  respectively. Assuming no loss of energy, the final temperature of the mixture is  
(a)  $(n_1^2T_1^2 + n_2^2T_2^2 + n_3^2T_3^2) / (n_1T_1 + n_2T_2 + n_3T_3)$   
(b)  $(T_1 + T_2 + T_3) / 3$   
(c)  $(n_1T_1 + n_2T_2 + n_3T_3) / (n_1 + n_2 + n_3)$   
(d)  $(n_1T_1^2 + n_2T_2^2 + n_3T_3^2) / (n_1T_1 + n_2T_2 + n_3T_3)$
- Consider a biased coin in which the probability of getting heads is  $p$  and tails is  $(1 - p)$ . The entropy  $S$  of this probability distribution is maximum for  
(a)  $p = 1$  (b)  $p = 0$  (c)  $p = 0.5$  (d)  $p = 0.25$
- A particle oscillates in a one dimensional potential of the form  $V(x) = ax^6$ . If the amplitude of the oscillation is doubled, the time period of the oscillation will  
(a) double (b) become one fourth (c) remain same (d) become half
- A Carnot engine operation between temperatures  $T_1$  and  $T_2$  has efficiency  $1/6$ . When  $T_2$  is lowered by 62 K, its efficiency increases to  $1/3$ . Then  $T_1$  and  $T_2$  are respectively  
(a) 310 K and 248 K (b) 372 K and 310 K (c) 372 K and 330 K (d) 330 K and 268 K
- A boat is moving due east in a region where the earth's magnetic field is  $5.0 \times 10^{-5} \text{ NA}^{-1}$  due north and horizontal. The boat carries a vertical aerial 2 m long. If the speed of the boat is  $1.50 \text{ ms}^{-1}$ , the magnitude of the induced emf in the wire of aerial is  
(a) 0.15 mV (b) 1 mV (c) 0.75 mV (d) 0.50 mV
- 100 g of water is heated from 30 °C to 50 °C. Ignoring the expansion of water, the changes in the internal energy is (specific heat of water = 4184 J/ kg / K)  
(a) 2.1 kJ (b) 4.2 kJ (c) 8.4 kJ (d) 84 kJ

**Course Outline and Test pattern:**

Upto B.Sc. honours in Physics/Chemistry/Biology syllabus. The paper is of objective type. Entrance test has 50 objective type questions. Each question carries 2 marks. For every incorrect answer 0.5 marks will be deducted. The question ratio will be as follows:-Physics: Chemistry: Biology :: 4:3:3

**Model questions:**

1. A field is irrotational if it is  
(a) gradian (b) div  
(c) Curl (d) None of the above
2. For a Gaussian wave packet described by  $G(x) = A \exp(-x^2/a^2)$  the expectation value of momentum operator is  
(a) zero (b) undefined  
(c) +a (d) -a
3. Insulin is secreted by the \_\_\_\_\_ cells of pancreas  
(a) a (b) b  
(c) d (d) ab
4. What is the total number of moles of hydrogen gas contained in  $9.03 \times 10^{23}$   
(a) 1.5 moles (b) 2.00 moles  
(c) 0.02 moles (d) 0.03 moles
5. Consider a uniform square plate of side 'a' and mass 'm'. The moment of inertia of this plate about an axis perpendicular to its plane and passing through one of its corners is  
(a)  $4/6 ma^2$  (b)  $3/4 ma^2$   
(c)  $2/3 ma^2$  (d)  $1/5 ma^2$
6. An electric dipole is placed at an angle of  $30^\circ$  to a non-uniform electric field. The dipole will experience  
(a) a torque only  
(b) a translational force only in the direction of the field  
(c) a translational force only in a direction normal to the direction of the field  
(d) a torque as well as a translational force
7. Which of the following statements in relation to the hydrogen atom is correct?  
(a) 3s orbital is lower in energy than 3p orbital  
(b) 3p orbital is lower in energy than 3d orbital  
(c) 3s and 3p orbitals are of lower energy than 3d orbital  
(d) 3s, 3p and 3d orbitals all have the same energy
8. Which of the following equations is correct?  
(a)  $ZnO + H_2SO_4 = ZnSO_4 + H_2O$   
(b)  $2ZnO + H_2SO_4 = Zn_2SO_4 + H_2O_2$   
(c)  $ZnO + 2H_2SO_4 = Zn(SO_4)_2 + 2H_2O$   
(d)  $2ZnO + H_2SO_4 = 2Zn(OH) + SO_2 + O_2$
9. Most of the algae lack skeleton since  
(a) specific gravity of water is high so that water supports their weight  
(b) hydrostatic skeleton provides internal support  
(c) synthesis of secondary wall material or external deposits is energy intensive  
(d) all the above

## Integrated M.Sc. and B.Sc. B. Ed. in Physics

### Course Outline and Test pattern:

Test comprising of 50 objective type questions in two sections. The first section shall contain 35 questions in Physics and the second section shall contain 15 questions from Mathematics, Chemistry, Biology & General. Each question carries 2 marks and **0.5 marks will be deducted for each wrong answer.**

### Model questions:

#### Section A: Physics

1. The S.I. unit of Electric charge is  
(a) Coulomb      (b) Ampere      (c) Weber      (d) Volt
2. The image formed by concave lens is  
(a) Real      (b) Virtual      (c) Real as well as virtual      (d) no image forms
3. The Lenz's law is in direct consequence of  
(a) Conservation of momentum      (b) Conservation of charge  
(c) Conservation of energy      (d) Conservation of angular momentum
4. The torque experienced by magnetic dipole having dipole moment "M" placed in uniform magnetic field (B) is :  
(a)  $B \times M$       (b)  $M \times B$       (c) Zero      (d)  $M \cdot B$
5. Optical fibre works on the principle of  
(a) Refraction of light      (b) Diffraction of light  
(c) Polarization of light      (d) Total Internal Reflection
6. Kirchhoffs first law ( $\sum i = 0$ ) and second law ( $\sum iR = \Sigma E$ ), where symbols have their usual meanings, are respectively based on  
(a) Conservation of charge, Conservation of momentum  
(b) Conservation of energy, Conservation of charge  
(c) Conservation of momentum, Conservation of charge  
(d) Conservation of charge, Conservation of energy
7. A material "B" has twice the specific resistance of "A". A circular wire made up of "B" has twice the diameter of a wire made of "A". Then for the two wires to have the same resistance, the ratio ( $I_B/I_A$ ) of their respective lengths must be:  
(a) 1      (b)  $\frac{1}{2}$       (c)  $\frac{1}{4}$       (d) 2
8. Which of the following units denotes the dimension  $[ML^2/Q^2]$ , where Q denotes the electric charge?  
(a)  $Wb/m^{-2}$       (b) Henry (H)      (c)  $H/m^2$       (d) Weber (Wb)
9. In a two body problem (particle A striking the particle B) relation between and is  
(a)  $KE_{CM} = \left(\frac{m_A}{m_A + m_B}\right) KE_{LAB}$       (b)  $KE_{CM} = \left(\frac{m_A}{m_B}\right) KE_{LAB}$   
(c)  $KE_{CM} = \left(\frac{m_B}{m_A + m_B}\right) KE_{LAB}$       (d)  $KE_{LAB} = \left(\frac{m_B}{m_A + m_B}\right) KE_{CM}$

10. The half-life of Na-24 is 15.0 h. Time required to decay 80 percent of a sample of this nuclide is
- (a) 34.8 h                      (b) 40 h                      (c) 15 days                      (d) 30h

**Section B:** Maths/Chemistry/Biology/General

This section shall contain 15 multiple choice questions from Maths, Chemistry & Biology (upto 10+2 standard) and General.

## DEPARTMENT OF SOCIAL WORK

### M.A. in Social Work

#### Course Outline and Test pattern:

There shall be 100 marks in two groups of 50 marks each. The first group will consist of multiple choice questions and the second group will have short descriptive type questions. Questions will be on general awareness, current affairs, knowledge about civil society initiatives, social justice, various social issues and challenges.

#### Model Questions:

1. i) Which date is observed as *World Social Justice Day* ?  
(a) 20 February (b) 28 February (c) 1 January (d) 25 December
  - ii) Which date is *International Mother Language Day* ?  
(a) 1 March (b) 20 February (c) 2 October (d) 5 December
  - iii) Which date is observed as *World Disabled Day* ?  
(a) 30 January (b) 1 May (c) 15 March (d) 14 April
  - iv) Which of the following dates is *World Health Day* ?  
(a) 26 January (b) 28 February (c) 1 March (d) 7 April
  - v) Which date is celebrated internationally as *World Red Cross Day* ?  
(a) May 8 (b) April 30 (c) May 15 (d) November 30
2. i) Satish Dhawan Space Centre is situated in :  
(a) Mumbai (b) Ahmedabad (c) Sri Hari Kota (d) Baleswar
  - ii) Name of the eminent scientist who was awarded *Bharat Ratna* in 2014  
(a) C.N.R.Rao (b) Kasturi Rangan (c) A.P.J Kalam (d) K. Radhakrishnan
  - iii) Who was awarded posthumously the *Ashok Chakra* gallantry award on Republic Day, 2014?  
(a) Navdeep Singh (b) Prasad Babu (c) Rajesh Kumar (d) Hemt Karkare
  - iv) Who is the author of the book *Ignited Minds* ?  
(a) Dr. S. Radhakrishnan (b) Dr. A.P.J. Abdul Kalam  
(c) Dr. Rajendra Prasad (d) Jawaharlal Nehru
  - v) Name the African leader who fought against apartheid successfully :  
(a) Jacob Zuma (b) Thabo Mbeki (c) Kgalema Motlanthe (d) Nelson Mandela
3. Deabrivation  
i) 3G (a) Three Generations (b) Third Generation  
(c) Third Gear (d) Three Greates
  - ii) Bc (a) Before Christ (b) Birth Control  
(c) British Council (d) Bombay Cinema
  - iii) RoM (a) Read only memory (b) ruins of Memorials  
(c) Road of Mountains (d) Road of Rome
  - iv) BPL (a) British Petroleum Limited (b) Bharat Petroleum Limited  
(c) Blood Pressure Limit (d) Below Poverty Line

- V) CBI (a) Central Bureau of Intelligence (b) Central Bureau of Investigation  
(c) Central Broadcaster of India (d) Central Board of Intelligence

4. Write Short Notes on the following (5 Marks Each)

- a) Right to Information
- b) Right to Education
- c) Mahatma Gandhi National Rural Employment Guarantee Act
- d) National Rural Health Mission

5. Write an essay on any one of the following (20 Marks)

- a) Domestic Violence
- b) Television and Rural Development
- c) Witch Hunting
- d) NGO's and Social Change

DEPARTMENT OF SOCIOLOGY

M.A. in Sociology

The written test includes questions (objective as well as subjective type) on (i) general awareness and (ii) understanding of various socio-economic issues.

Objective -50 marks, Descriptive-50 marks

**Model questions:**

**Type I.** Choose the correct answer.

20 x 2 = 40

1. The 'Lepchas' belong to which state of North-East India?  
(a) Arunachal Pradesh (b) Sikkim (c) Mizoram (d) Nagaland
2. Who remarked 'Assamese women weave fairy tales in their clothes'?  
(a) Mahatma Gandhi (b) Jawaharlal Nehru (c) Verrier Elwin (d) J.H. Hutton
3. Which state of North-East India is the only state in India where the four cats, i.e. Tiger, Leopard, Clouded Leopard and Snow Leopard are found?  
(a) Manipur (b) Sikkim (c) Arunachal Pradesh (d) Tripura
4. The Lushai hills was the earlier name of  
(a) Nagaland (b) Mizoram (c) Manipur (d) Arunachal Pradesh
5. Mesopotamia is the old name of  
(a) Iran (b) Iraq (c) Turkey (d) Egypt
6. Which blood group is considered as the universal recipient?  
(a) A+ (b) B+ (c) AB+ (d) O+
7. The mass of the moon in comparison to the earth is  
(a) 1/60 (b) 1/70 (c) 1/80 (d) 1/90
8. The earth completes one rotation on its axis in (hour, minutes and seconds)  
(a) 23 h 56 min 4.09 s (b) 23 h 59 min 9.99 s  
(c) 23 h 60 min 0.00 s (d) 24 h 00 min 0.00 s
9. The latitude 'AA' on the map represents the  
(a) The Tropic of Cancer (b) The Tropic of Capricorn  
(c) The Hemisphere (d) The Equator
10. Who is the author of the book *Black Holes and Baby Universes*?  
(a) Stephen Hawking (b) Amartya Sen (c) Albert Einstein (d) Salman Rushdie
11. Who wrote the book *Who Were the Shudras*?  
(a) M.N. Srinivas (b) Andre Beteille (c) B. R. Ambedkar (d) M.S.A. Rao
12. When is World Environment Day?  
(a) June 5 (b) July 11 (c) October 2 (d) December 10
13. 'Shintoism' is a religion practiced by about 0.1 % population of the world; it is developed out of primitive nature and ancestor worship. Where is it found?  
(a) Israel (b) Japan (c) China (d) Thailand
14. Who was the Governor-General when the 1857 revolt broke out?  
(a) Lord Dalhousie (b) Lord Canning (c) Lord Curzon (d) Lord Lawrence

15. Who is the Grand Old Man of India?  
 (a) Raja Ram Mohan Roy (b) Dadabhai Naoroji  
 (c) Bal Gangadhar Tilak (d) Swami Vivekananda
16. The term 'society' in sociology is used to refer to  
 (a) persons living in an area (b) gathering of persons for a purpose  
 (c) the system of social relationships (d) collection of NGOs
17. Polygyny means  
 (a) plurality of husbands (b) plurality of partners  
 (c) plurality of wives (d) none of these
18. Which of the following is an example of material culture?  
 (a) belief in heaven (b) automobiles  
 (c) folklore (d) spiritualism
19. Who introduced the term 'folkways'?  
 (a) Auguste Comte (b) Emile Durkheim  
 (c) William Graham Sumner (d) Robert Redfield
20. Which of the following is a basic characteristic of caste?  
 (a) Endogamy (b) Exogamy  
 (c) Monogamy (d) Polygamy

**Type II.** Match the following:

5 x 2 = 10

**List I**

- A. Vilfredo Pareto  
 B. Erving Goffman  
 C. Herbert Spencer  
 D. Karl Marx  
 E. Talcott Parsons

**List II**

- i) Organic Analogy  
 ii) Theory of Social Action  
 iii) Dramaturgy  
 iv) Circulation of the Elite  
 v) Das Capital

Codes

- (a) A = iv, B = iii, C = i, D = v, E = ii  
 (b) A = iii, B = iv, C = v, D = i, E = ii  
 (c) A = i, B = v, C = iv, D = ii, E = iii  
 (d) A = v, B = iv, C = iii, D = ii, E = i

**Type III.** Write short notes on **any two** (within 150 words):

10 x 2 = 20

1. Global Warming
2. Lokpal Bill
3. Globalisation and its impact on Indian society.
4. Sociology as a science.

**Type IV.** Answer **any two** of the following questions (within 250 words):

15 x 2 = 30

1. Unity in diversity is India. Discuss
2. Discuss the causes and consequences of poverty in India.
3. What is communalism? Why is it a threat to national integration?
4. Discuss the distribution of different ethnic groups inhabiting North-East India.