

*General Instructions :*

- i) The question-cum-answer booklet contains *two* Groups, **Group – I & Group – II**.
- ii) **Group – I** contains two Parts, **Part – A & Part- B** and **Group – II** contains *two* Parts, **Part – C & Part – D**.
- iii) In **Group – I, Part – A** consists of 39 questions and **Part – B** consists of 11 questions. In **Group – II, Part – C** consists of 21 questions and **Part – D** consists of 6 questions.
- iv) Space has been provided in the question-cum-answer booklet itself to answer the questions.
- v) Follow the instructions given in **Part – A** of **Group – I** and **Part – C** of **Group – II** and write the correct answer in full in the space provided below each question.
- vi) For **Part – B** of **Group – I** and **Part – D** of **Group – II** enough space for each question is provided. You have to answer the questions in the space provided.
- vii) **Space for Rough Work** has been printed and provided at the bottom of each page except Page No. 32.

**GROUP - I**  
**( Physics & Chemistry )**  
**( Marks : 65 )**  
**PART - A**

*Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the most appropriate alternative and write it in the space provided below each question.

$$39 \times 1 = 39$$

1. North pole of a bar magnet is continuously thrust in and pulled out of the coil of conductor connected to a galvanometer several times, then the pointer of the galvanometer
  - (A) remains at zero
  - (B) deflects on either side of the zero
  - (C) moves towards the left side of the zero
  - (D) deflects towards the right side of the zero.

*Ans :* \_\_\_\_\_

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**( SPACE FOR ROUGH WORK )**

2. A cyclist riding a cycle fitted with a dynamo to a tyre gets bright light in the bulb connected, when he pedals fast. This is because,
- (A) magnet becomes powerful, when wheel rotates faster and current flows fast
  - (B) current flows easily when cycle goes fast
  - (C) more magnetic lines of force change with respect to the coil and leading to more current
  - (D) coil becomes hot due to friction and produces more current.

Ans : \_\_\_\_\_

3. A person wrongly uses infrared rays to detect a flaw in a machine part. The correct radiation he should be using is,
- (A) X-ray
  - (B) ultra-violet ray
  - (C) micro-wave
  - (D) visible light.

Ans : \_\_\_\_\_

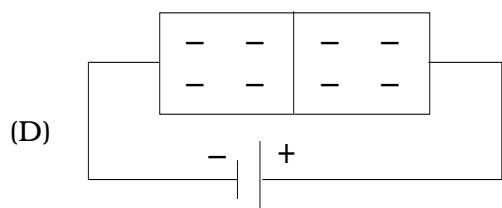
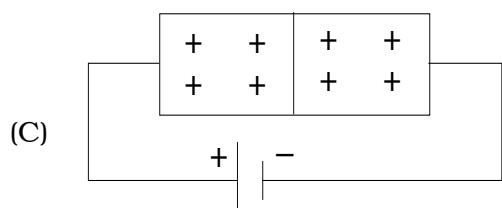
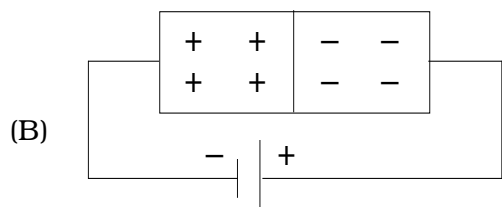
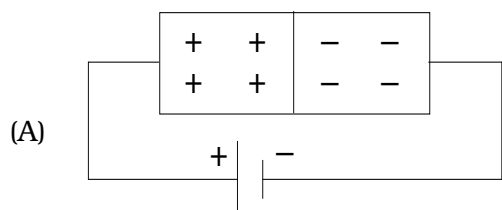
4. The frequency of a radiowave, having a wavelength of 300 m is
- (A)  $10^6$  Hz
  - (B)  $10^6$  kHz
  - (C)  $10^6$  km
  - (D)  $10^6$  m.

Ans : \_\_\_\_\_

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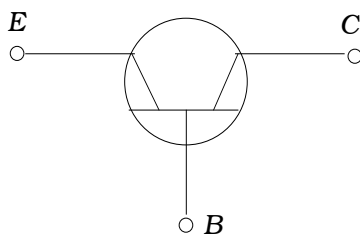
( SPACE FOR ROUGH WORK )

5. Which of the following indicates forward biasing ?



Ans : \_\_\_\_\_

6. To convert the incomplete diagram into *npn* transistor symbol, the direction of the arrow mark should be from



(A) *B* to *C*

(B) *C* to *B*

(C) *E* to *B*

(D) *B* to *E*.

Ans : \_\_\_\_\_

( SPACE FOR ROUGH WORK )

7. In the radio transmission the process of superimposing A.F. signals on R.F. wave is called
- (A) modulation
  - (B) demodulation
  - (C) rectification
  - (D) amplification.

Ans : \_\_\_\_\_

8. Which one of the following is an application of centrifugal reaction ?
- (A) Separating butter from curds with a churner
  - (B) Separation of petroleum products
  - (C) Concentration of haematite ore
  - (D) Drying clothes in sun.

Ans : \_\_\_\_\_

9. If a string whirling with a stone snaps, then the motion of the stone will be
- (A) in the direction of the circular motion
  - (B) towards the centre of the circular path
  - (C) tangential to the circular path
  - (D) opposite to the direction of the circular path.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

10. If the distance between two heavenly bodies increases by two times then the gravitational force between them
- (A) decreases by 4 times                      (B) increases by 4 times
- (C) decreases by  $\frac{1}{2}$  time                      (D) increases by 2 times.

Ans : \_\_\_\_\_

11. Which one of the following is true if an object is falling freely under gravity ?
- (A) Its mass decreases
- (B) It experiences weightlessness
- (C) Its weight increases
- (D) Its mass becomes zero.

Ans : \_\_\_\_\_

12. Rayleigh scattering of light is called coherent because
- (A) there is change in the wavelength of light
- (B) there is change in the frequency of light
- (C) there is no change in the wavelength of light
- (D) there is change in both frequency and wavelength of light.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

13. While studying Raman effect, a person uses light from the fluorescent lamp. To correct this mistake, he must use light from the source,

- (A) tungsten filament lamp
- (B) sun
- (C) sunlight passed through a lens
- (D) monochromatic sodium vapour lamp.

Ans : \_\_\_\_\_

14. Rainbow is an example for the spectrum of the type

- (A) pure
- (B) impure
- (C) line emission
- (D) line absorption.

Ans : \_\_\_\_\_

15. Ultrasound signal sent by a sonar situated at the surface of ocean takes 6 seconds to return from the floor of the ocean. The depth of the ocean floor is

- (A) 4.5 km
- (B) 0.45 km
- (C) 9.5 km
- (D) 45 km.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

16. The radar gun used by traffic police to detect the speeding vehicles, works on the principle of Doppler effect. The wave used is
- (A) Radiowave
  - (B) Soundwave
  - (C) Visible light
  - (D) Ultrasonic.

Ans : \_\_\_\_\_

17. The colour of the star having highest temperature is
- (A) red
  - (B) yellow
  - (C) yellowish white
  - (D) bluish white.

Ans : \_\_\_\_\_

18. Relatively low temperature regions on the surface of the sun are caused by
- (A) magnetic activities below photosphere
  - (B) thermonuclear fusion reaction
  - (C) nuclear fission reaction
  - (D) ionisation of gases.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

19. In the evolution of stars, heavy elements like iron are formed during the stage,

- (A) Protostar
- (B) Red giant
- (C) Steady state
- (D) Supernova.

Ans : \_\_\_\_\_

20.  ${}_{100}X^{300}$  is a radioactive element. It transmutes into element Y after emitting an alpha particle. The element Y can be written as

- (A)  ${}_{101}Y^{300}$
- (B)  ${}_{102}Y^{296}$
- (C)  ${}_{98}Y^{296}$
- (D)  ${}_{98}Y^{304}$  .

Ans : \_\_\_\_\_

21. The moderator in a nuclear plant is usually made of

- (A) graphite
- (B) cadmium
- (C) water
- (D) sodium.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )



22. Radiation hazard may cause the disease,

- (A) Leukemia (B) Cholera  
(C) Typhoid (D) Night blindness.

Ans : \_\_\_\_\_

23. In a solar water heater the copper pipe is painted black because it helps

- (A) in better absorption of light  
(B) to prevent corrosion  
(C) to radiate heat to the surrounding  
(D) in the absorption of heat by water.

Ans : \_\_\_\_\_

24. The reason for the enormous output of energy from the sun is

- (A) combustion of hydrogen gas  
(B) fission of helium nuclei  
(C) fusion of hydrogen nuclei  
(D) friction between hydrogen atoms.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

25. Which one of the following is a method of increasing the weight of the body on earth without changing the mass ?

- (A) Taking the body to the poles
- (B) Powdering the body
- (C) Cooling it below  $0^{\circ}\text{C}$
- (D) Magnetising the body.

Ans : \_\_\_\_\_

26. Now-a-days people prefer to use compact fluorescent tube more because

- (A) they can be easily produced
- (B) they save electrical energy
- (C) they are produced in the small scale industries
- (D) they give more light with less heat.

Ans : \_\_\_\_\_

27. Which of the following ores is a carbonate ore of iron ?

- (A) Haematite
- (B) Magnetite
- (C) Limonite
- (D) Siderite.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

28. The best combination of metal and an acid to prepare hydrogen gas is

- (A) copper and nitric acid
- (B) copper and dilute hydrochloric acid
- (C) zinc and dilute hydrochloric acid
- (D) copper and dilute sulphuric acid.

Ans : \_\_\_\_\_

29. In the extraction of amorphous silicon, magnesium is used as a reducing agent. The product is washed with hydrofluoric acid, to remove

- (A) extra magnesium
- (B) unchanged silica
- (C) amorphous silicon
- (D) extra quartz.

Ans : \_\_\_\_\_

30. Though silicon is a non-metal, when warmed it becomes a semiconductor due to

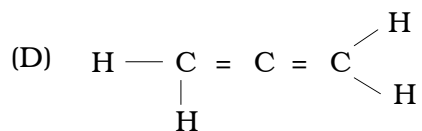
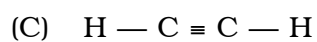
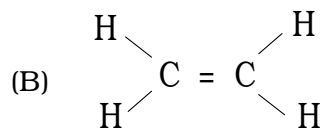
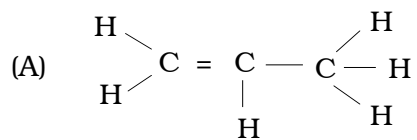
- (A) electrons released by breaking of covalent bonds
- (B) electrons released by breaking of ionic bonds
- (C) movement of electrons of innermost orbitals
- (D) formation of covalent bonds.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

31. The correct structural formula of propene in the following is



Ans : \_\_\_\_\_

32. An officer during an emission test on a car, detects more than 10% of carbon monoxide. This could be due to

- (A) the quantity of oxygen supplied is more
- (B) heat released is more
- (C) complete combustion of fuel
- (D) incomplete combustion of fuel.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

33. A benzene ring structure could be changed to toluene by

- (A) adding  $\text{CH}_3$  group
- (B) replacing H by  $\text{CH}_3$  group
- (C) replacing H by CH group
- (D) adding  $\text{NO}_2$  group.

Ans : \_\_\_\_\_

34. A manufacturer of cooking utensils wants to fix plastic handles to them. The plastic he can select is

- (A) PVC
- (B) Polythene
- (C) Bakelite
- (D) Nylon.

Ans : \_\_\_\_\_

35. The gaseous product released during the manufacturing of soda glass is

- (A) Carbon dioxide
- (B) Sulphur dioxide
- (C) Nitrogen dioxide
- (D) Nitric oxide.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

36. Cement containing higher percentage of gypsum than required,

- (A) sets slowly (B) sets rapidly  
(C) does not set at all (D) gets higher strength.

Ans : \_\_\_\_\_

37. The ion which can be removed by Permutit process is

- (A) Lead (B) Calcium  
(C) Iron (D) Manganese.

Ans : \_\_\_\_\_

38. The by-product of the process of saponification is

- (A) Methanol (B) Glycol  
(C) Glycerol (D) Sodium hydroxide.

Ans : \_\_\_\_\_

39. In the process of preparation of detergents, the organic acids produced are neutralized with

- (A) sodium hydroxide (B) sodium sulphate  
(C) sodium chloride (D) sodium nitrate.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

**PART - B**

40. Draw a neat sketch of the graphs showing the direction of the induced current in both A.C. and D.C. dynamos. 2

41. Draw a neat sketch of a single stage rocket. 2

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( SPACE FOR ROUGH WORK )

42. What are geo-stationary satellites ? Write any one use of geo-stationary satellites. At what height should they be located ? 2

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43. What is a galaxy ? Mention the types of galaxies. 2

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( SPACE FOR ROUGH WORK )



44. Write the structural formulae of Isobutane and Cyclohexane.

1 + 1

45. During beta decay of a radioactive element, what changes take place in the nucleus of an atom ? Represent the changes taking place in the transmutation of radio carbon by beta emission.

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( SPACE FOR ROUGH WORK )

46. Give one reason for each of the following :

- a) Fissionable material should have certain critical size. 1

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- b) People working in nuclear power station wear lead jackets. 1

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47. Softening of hard water by boiling is easiest, yet we need to consider other methods of softening. Why ? 2

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( SPACE FOR ROUGH WORK )

48. Write any two differences between laser light and ordinary light.

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49. Draw a neat diagram of a blast furnace.

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( SPACE FOR ROUGH WORK )

50. In a petrol engine write a function for each of the following :

i) Crankshaft : 1

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ii) Carburettor : 1

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iii) Spark plug : 1

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iv) Inlet valve : 1

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( SPACE FOR ROUGH WORK )

**GROUP - II****( Biology )****( Marks : 35 )****PART - C**

Four alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the most appropriate alternative and write it in the space provided below each question.

 $21 \times 1 = 21$ 

51. The plant that possesses Reticulate Venation is

(A) Paddy

(B) Mustard

(C) Ragi (D)

Jowar.

Ans : \_\_\_\_\_

52. An example for Pteridophyta is

(A) Adiantum

(B) Funaria

(C) Riccia

(D) Marchantia.

Ans : \_\_\_\_\_

53. The number of chambers in the heart of tortoise is

(A) two

(B) three

(C) four

(D) five.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

54. The type of epithelial tissue found in the inner layer of the small intestine is

- (A) Squamous epithelium
- (B) Columnar epithelium
- (C) Ciliated epithelium
- (D) Cuboidal epithelium.

Ans : \_\_\_\_\_

55. Meristematic tissue is not found in

- (A) Bark
- (B) Root tip
- (C) Stem apex
- (D) Buds.

Ans : \_\_\_\_\_

56. The tissue which gives shape, support, protection and helps in movement is

- (A) Epithelial tissue
- (B) Muscular tissue
- (C) Bone tissue
- (D) Nervous tissue.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

57. In nervous system, spinal nerves are the basic components of

- (A) central nervous system
- (B) peripheral nervous system
- (C) sympathetic system
- (D) para-sympathetic system.

Ans : \_\_\_\_\_

58. The excess secretion of growth hormone in adults causes

- (A) Acromegaly
- (B) Gigantism
- (C) Dwarfism
- (D) Cretinism.

Ans : \_\_\_\_\_

59. The part of the inner ear, concerned with balancing of the body is

- (A) Utriculus
- (B) Sacculus
- (C) Cochlea
- (D) Organ of Corti.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

60. HIV is covered with double layered membrane which is made up of

- (A) Carbohydrates
- (B) Fats
- (C) Proteins
- (D) Minerals.

Ans : \_\_\_\_\_

61. HIV is transmitted by

- (A) sharing food with AIDS patient
- (B) shaking hands with AIDS patient
- (C) using common toilets
- (D) sharing unsterilized syringes used by AIDS patient.

Ans : \_\_\_\_\_

62. The part of the digestive system which is affected by Hepatitis-B, is

- (A) Stomach
- (B) Pancreas
- (C) Intestine
- (D) Liver.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )



63. Food adulteration means

- (A) weighing less quantity
- (B) adding substances of inferior quality
- (C) adding more vital components
- (D) weighing with polythene cover.

Ans : \_\_\_\_\_

64. Which is an accidental adulteration ?

- (A) Stones in rice
- (B) Talcum powder in wheat flour
- (C) Jaggery in honey
- (D) Vegetables with traces of insecticides.

Ans : \_\_\_\_\_

65. The common adulterant found in Red Chilli powder is

- (A) coloured saw dust
- (B) used tea powder
- (C) metanil yellow
- (D) papaya seeds powder.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

66. A biotic component of environment is

- (A) Bacteria
- (B) Water
- (C) Air
- (D) Soil.

Ans : \_\_\_\_\_

67. The organism that does not involve directly in the fixation of nitrogen, is

- (A) Anabaena
- (B) Diatom
- (C) Nostoc
- (D) Leguminous plant.

Ans : \_\_\_\_\_

68. The gaseous pollutant, more responsible for acid rain, is

- (A) sulphur dioxide
- (B) carbon dioxide
- (C) carbon monoxide
- (D) nitrogen oxide.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

69. The biodegradable pollutant is

- (A) DDT
- (B) glass
- (C) wood
- (D) plastic.

Ans : \_\_\_\_\_

70. The world's first clone is

- (A) Sheep
- (B) Hen
- (C) Cow
- (D) Buffalo.

Ans : \_\_\_\_\_

71. The type of Biotechnology applied in Forensic Science is

- (A) Genetic Engineering
- (B) DNA fingerprint technology
- (C) Tissue culture
- (D) Cloning.

Ans : \_\_\_\_\_

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( SPACE FOR ROUGH WORK )

**PART - D**

- Instructions :* i) Answer the following questions.  
ii) Write the answers in brief according to the questions.

72. Draw a neat diagram of root system in monocot plant. 2

73. Name the protein that gives red colour to the blood. What is its function ? 2

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( SPACE FOR ROUGH WORK )

74. After relay race, Runner-A, pours glucose powder into his mouth. Runner-B tastes the glucose slowly with tip of his tongue. Whom do you think, experiences the sweetness most ? Why ? 2

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75. Nowadays birds are decreasing in thickly populated area. Give two reasons. 2

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76. Mention two pollutants, which pollute public water sources in rural areas. 2

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( SPACE FOR ROUGH WORK )

77. Draw a neat diagram of vertical section of human eye. Label Cornea and Choroid. 4

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( SPACE FOR ROUGH WORK )

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( SPACE FOR ROUGH WORK )