

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. The relation between the directions of electric current in magnetic field, and the mechanical force acting on the conductor is given by
 - (A) Fleming's right hand rule
 - (B) Faraday's law
 - (C) Fleming's left hand rule
 - (D) Newton's law.

Ans : _____

(SPACE FOR ROUGH WORK)

2. The dopant needed in the preparation of n type of semiconductor to Germanium is
- (A) Phosphorus (B) Indium
(C) Boron (D) Galium.

Ans : _____

3. The audio information is changed into corresponding electrical signal in radio transmitter by
- (A) amplifier
(B) oscillator
(C) transducer
(D) microphone.

Ans : _____

4. The instrument which converts electricity required for the tape recorder from domestic circuit is
- (A) diode
(B) oscillator
(C) amplifier
(D) voltameter.

Ans : _____

(SPACE FOR ROUGH WORK)

5. 'When we are moving in a cycle which is negotiating a curve, our body leans towards the centre of the curve.' The reason is

- (A) Centrifugal reaction (B) Centripetal force
(C) Gravitational force (D) Force of the cycle.

Ans : _____

6. In rail tracks the outer rail track is raised in a curve a little above the inner rail track. This reduces

- (A) velocity
(B) wear and tear
(C) inertia
(D) acceleration.

Ans : _____

7. The formula to find the force acting between the masses m_1 and m_2 when the distance between them is d , is

- (A) $F = \frac{d^2 m_1}{G m_2}$ (B) $F = \frac{m_1 G}{m_2 d^2}$
(C) $F = \frac{G m_1 m_2}{d^2}$ (D) $F = \frac{m_1 m_2}{G d^2}$.

Ans : _____

(SPACE FOR ROUGH WORK)

8. The device that is not required in the diesel engine is

- (A) Piston
- (B) Crankshaft
- (C) Carburettor
- (D) Injection pump.

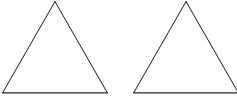
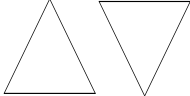
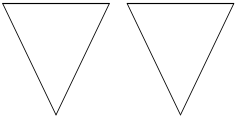
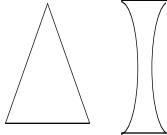
Ans : _____

9. The working stage of the internal combustion engine, with both the inlet and outlet valves closed is

- (A) Intake
- (B) Compression
- (C) Crankshaft
- (D) Exhaust.

Ans : _____

10. The proper arrangement of prisms to get composite light from seven colours of light is

- (A) 
- (B) 
- (C) 
- (D) 

Ans : _____

(SPACE FOR ROUGH WORK)

11. The colour of the ray which comes out when a red ray of light is passed through a prism is
- (A) green (B) white
(C) red (D) yellow.

Ans : _____

12. Name of the scientist who showed that the scattered light contained higher and lower frequencies in addition to that of incident light is
- (A) Tyndall
(B) Rayleigh
(C) C. V. Raman
(D) Fraunhofer.

Ans : _____

13. Formula to calculate the centripetal force on a body in the circular motion is
- (A) $f = mv^2$
(B) $f = \frac{mv^2}{r}$
(C) $f = \frac{m^2v}{r^2}$
(D) $f = \frac{rv^2}{m}$.

Ans : _____

(SPACE FOR ROUGH WORK)

14. As the multistage rockets go higher and higher then its

- (A) velocity decreases
- (B) mass increases
- (C) mass decreases
- (D) efficiency decreases.

Ans : _____

15. Minimum velocity required for a body to escape from gravitational field of the earth is called

- (A) orbital velocity
- (B) escape velocity
- (C) initial velocity
- (D) final velocity.

Ans : _____

16. The happening at any part of the world can be viewed in the direct telecast with the help of

- (A) Remote sensing satellite
- (B) Communication satellites
- (C) Sounding rocket
- (D) Spacecraft.

Ans : _____

(SPACE FOR ROUGH WORK)

17. Frequency range of the audible sound is

- (A) less than 20 Hz
- (B) more than 20 Hz
- (C) 20 Hz to 20 kHz
- (D) 20 Hz to 200 Hz.

Ans : _____

18. The technique used in the study of heart diseases is

- (A) Radar ranging
- (B) Radiography
- (C) Radar gun
- (D) Echocardiography.

Ans : _____

19. The colour of the Betelgeuse star is

- (A) Orange yellow
- (B) Bluish white
- (C) Yellow
- (D) Red.

Ans : _____

(SPACE FOR ROUGH WORK)

20. The shape of the life-cycle of a star when the internal energy decreases and becomes dimmer until it emits no light is

- (A) Protostar (B) Red giant
(C) White dwarf (D) Black dwarf.

Ans : _____

21. Irregular patches on the surface of the sun are called

- (A) Solar prominences
(B) Solar flares
(C) Sunspots
(D) Polar light.

Ans : _____

22. Which isotope is used in the treatment of overactive thyroid glands ?

- (A) Radio Iron
(B) Radio Sodium
(C) Radio Iodine
(D) Radio Carbon.

Ans : _____

(SPACE FOR ROUGH WORK)

23. The metal cover used in the walls of the nuclear reactor to prevent radioactive radiation being released to the environment is

- (A) Iron (B) Aluminium
(C) Lead (D) Copper.

Ans : _____

24. A nuclear reactor has to be shut down. The rods used for shutting down are made up of

- (A) Cadmium (B) Uranium
(C) Steel (D) Liquid sodium.

Ans : _____

25. Man has opted for the use of which of the following energies because of rapid depletion of fossil fuels ?

- (A) Electrical energy
(B) Water energy
(C) Solar energy
(D) Wind energy.

Ans : _____

(SPACE FOR ROUGH WORK)

26. Reason for painting the black colour on the inside walls of the solar cooker and outer surface of the container is to

- (A) increase the absorption of solar energy
- (B) maintain the quality of food
- (C) avoid flowing out of heat energy
- (D) reflect the solar radiation.

Ans : _____

27. Energy crisis means

- (A) absence of energy sources
- (B) energy demand is more than the supply
- (C) lack of knowledge to use the energy
- (D) energy supply is more than the demand.

Ans : _____

28. One of the remedial measures to overcome the energy crisis is by using

- (A) Compact fluorescent tubes
- (B) Incandescent electric bulbs
- (C) Electric stove for cooking
- (D) Curtains to windows and using electric light.

Ans : _____

(SPACE FOR ROUGH WORK)

29. Name of the copper ore is

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

Ans : _____

30. Atomic number of iron is 26. Its electronic configuration is

- (A) $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^{10}, 4s^1$
- (B) $1s^2, 2s^2 2p^6, 3s^2 3p^6 3d^6, 4s^2$
- (C) $1s^2, 2s^2 2p^6, 3s^1$
- (D) $1s^2, 2s^2 2p^6, 3s^2 3p^2$.

Ans : _____

31. Crystal that consists of silicon is

- (A) Copper sulphate
- (B) Topaz
- (C) Diamond
- (D) Graphite.

Ans : _____

(SPACE FOR ROUGH WORK)

32. Name of the compound of the silicon used in cutting glass is

- (A) Silicon dioxide
- (B) Sodium silicate
- (C) Silicon carbide
- (D) Sodium aluminium silicate.

Ans : _____

33. Molecular formula of ethene is

- (A) CH_4
- (B) C_2H_6
- (C) C_2H_4
- (D) C_2H_2 .

Ans : _____

34. General formula of alkane is

- (A) C_nH_{2n}
- (B) $\text{C}_n\text{H}_{2n+2}$
- (C) $\text{C}_n\text{H}_{2n-2}$
- (D) $\text{C}_{n+1}\text{H}_{2n}$

Ans : _____

(SPACE FOR ROUGH WORK)

35. The chemical used in the detection of leakage of liquid petroleum gas is

- (A) Ethyl alcohol
- (B) Methyl alcohol
- (C) Ethyl mercaptan
- (D) Ethane.

Ans : _____

36. The natural polymer is

- (A) Rayon
- (B) Nylon
- (C) Fat
- (D) Terylene.

Ans : _____

37. The polymer that is used in the preparation of electrical devices is

- (A) Neoprene
- (B) Polythene
- (C) Teflon
- (D) Thiokol.

Ans : _____

(SPACE FOR ROUGH WORK)

38. You have to prepare one prism to disperse light to get spectrum. The glass used is

- (A) Colour glass
- (B) Soda glass
- (C) Lead glass
- (D) Borosilicate glass.

Ans : _____

39. The salt which makes permanent hard water is

- (A) Magnesium sulphate
- (B) Magnesium bicarbonate
- (C) Calcium carbonate
- (D) Sodium chloride.

Ans : _____

(SPACE FOR ROUGH WORK)

PART - B

40. Mention any two factors that influence induced electromotive force. 1 + 1 = 2

41. a) What is photoelectric effect ? 1

b) Write the four uses of photoelectric effect. $4 \times \frac{1}{2} = 2$

(SPACE FOR ROUGH WORK)

c) How do we get more photons by photoelectric effect ?

1

42. Write any two laws of Kepler.

1 + 1 = 2

43. Draw a neat sketch of petrol engine.

2

(SPACE FOR ROUGH WORK)

44. a) What is galaxy ? How can we know the information about the velocities of galaxies ? $1 + \frac{1}{2} = 1 \frac{1}{2}$

b) Name the principle by which the motion of galaxies is studied. $\frac{1}{2}$

45. What is meant by induced radioactivity ? Give one example. $1 + 1 = 2$

(SPACE FOR ROUGH WORK)

46. Draw a neat sketch of nuclear power plant.

2

47. a) What is meant by froth flotation ?

1

(SPACE FOR ROUGH WORK)

49. Draw a neat diagram of water purification by permutit process.

2

50. An environmentalist respects a person who uses soap than a person who uses detergents. Give reason.

2

(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 tap root system among the following is

- (A) Paddy plant
- (B) Sugarcane plant
- (C) Mustard plant
- (D) Maize plant.

Ans : _____

52. An example for warm blooded animal is

- (A) Whale
- (B) Shark
- (C) Crocodile
- (D) Lizard.

Ans : _____

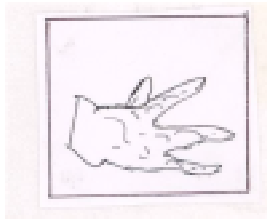
(SPACE FOR ROUGH WORK)

53. Which of the following plants does not belong to the same group ?

- (A) Selaginella (B) Sargassum
(C) Lycopodium (D) Nephrolepis.

Ans : _____

54. The following figure is the forelimb of a



- (A) Lizard (B) Tortoise
(C) Mouse (D) Frog.

Ans : _____

55. Number of cranial nerves in birds is

- (A) 30 pairs
(B) 31 pairs
(C) 10 pairs
(D) 12 pairs.

Ans : _____

(SPACE FOR ROUGH WORK)

56. The tissue responsible for the increase of girth in a tree is

- (A) Lateral meristem (B) Parenchyma
(C) Sclerenchyma (D) Apical meristem.

Ans : _____

57. Function of the dendrites is to carry

- (A) blood to the brain
(B) impulses towards the cell body
(C) messages away from the cell body
(D) antibodies to sensitive parts.

Ans : _____

58. Function not undertaken by the areolar tissue is

- (A) passing nutrients to other tissues
(B) providing framework to other tissues
(C) protecting the wall of the stomach
(D) digesting toxic substances and destroying them.

Ans : _____

59. The body temperature goes high when you suffer from viral infection. The part of the brain which is not functioning properly at that time is

- (A) Cerebrum
(B) Cerebellum
(C) Pons
(D) Hypothalamus.

Ans : _____

(SPACE FOR ROUGH WORK)

60. Part of the retina opposite to the pupil where a large number of cones is located is
- (A) Blind spot (B) Yellow spot
(C) Cornea (D) Conjunctiva.

Ans : _____

61. When a person is severely angry, his rate of heartbeat and respiration increases. The hormone which influences such change is
- (A) Thyroxin
(B) Androgen
(C) Adrenaline
(D) Dopamine.

Ans : _____

62. The HIV is covered by
- (A) membrane made of two layers of fatty acids
(B) single layer of carbohydrates
(C) double layers of protein
(D) double layers of carbohydrates.

Ans : _____

(SPACE FOR ROUGH WORK)

63. Scientists haven't been successful to develop a vaccine to AIDS because

- (A) HIV has a cover on which no medicine works
- (B) HIV is very minute in size
- (C) Body cells fail to identify HIV as an intruder
- (D) HIV has R.N.A. as genetic material.

Ans : _____

64. The food substance that does not belong to the same group is

- (A) Wheat
- (B) Sooji
- (C) Atta
- (D) Maida.

Ans : _____

65. The organ that is known as the chemical factory of the body is

- (A) Heart
- (B) Kidney
- (C) Spleen
- (D) Liver.

Ans : _____

(SPACE FOR ROUGH WORK)

66. Common adulterant with coffee powder is

- (A) Coloured saw dust
- (B) Tamarind seed powder
- (C) Ragi powder
- (D) Iron filings.

Ans : _____

67. Accidental adulteration among the following is

- (A) Traces of vanaspati in ghee
- (B) water in milk
- (C) traces of chemicals in apples
- (D) white stones with white rice.

Ans : _____

68. It is essential to keep water plants in an aquarium because the plants

- (A) increase the beauty of the aquarium
- (B) keep the temperature under control
- (C) form a part of the food for fish
- (D) replenish oxygen in water.

Ans : _____

(SPACE FOR ROUGH WORK)

69. The decomposition of which part of an animal body adds phosphorous to the nature ?

- (A) Bones (B) Muscles
(C) Hairs (D) Blood.

Ans : _____

70. The increase of the component in the atmospheric air which leads to 'Greenhouse effect' is

- (A) Sulphur Dioxide
(B) Oxides of nitrogen
(C) Organo-chlorine
(D) Carbon dioxide.

Ans : _____

71. The Bio-geochemical cycle that does not belong to the same group is

- (A) Carbon cycle
(B) Sulphur cycle
(C) Oxygen cycle
(D) Nitrogen cycle.

Ans : _____

(SPACE FOR ROUGH WORK)

PART - D

Instructions : i) Answer the following questions.

ii) Write the answers in brief according to the questions.

72. What are gymnosperms ? Name the two types of spores produced in them. 1 + 1 = 2

73. What is the cause of acromegaly ? What are its symptoms ? 1 + 1 = 2

(SPACE FOR ROUGH WORK)

74. Soil fertility is increased by cultivating pulse crops. How ? 2

75. What is tissue culture ? Write an application of it. 1 + 1 = 2

76. Draw a neat diagram of collenchyma and label the parts. 2

(SPACE FOR ROUGH WORK)

77. Draw a neat diagram of human ear and label the following parts :

4 × 1 = 4

a) Auditory canal

b) Stirrup

c) Cochlea

d) Eustachian tube.

(SPACE FOR ROUGH WORK)

(SPACE FOR ROUGH WORK)