NOTE : DO NOT BREAK THE SEAL UNTIL YOU GO THROUGH THE FOLLOWING INSTRUCTIONS

QUESTION BOOKLET

Diploma Polytechnic Entrance Test – 2010

Paper - I (SCIENCE)

Booklet No.

Roll No. | | | | | | |

Series **B** 104014

(Enter your Roll Number in the above space)

SEAL

Time Allowed : 1.30 Hours **Max. Marks : 70**

INSTRUCTIONS :

1. Use only BLACK or BLUE Ball Pen.
2. All questions are COMPULSORY.
3. Check the BOOKLET thoroughly.

   IN CASE OF ANY DEFECT – MISPRINTS, MISSING QUESTION/S OR DUPLICATION OF QUESTION/S, GET THE BOOKLET CHANGED WITH THE BOOKLET OF THE SAME SERIES. NO COMPLAINT SHALL BE ENTERTAINED AFTER THE ENTRANCE TEST.
4. Before you mark the answer, fill in the particulars in the ANSWER SHEET carefully and correctly. Incomplete and incorrect particulars may result in the non-evaluation of your answer sheet by the technology.
5. Write the SERIES and BOOKLET NO. given at the TOP RIGHT HAND SIDE of the question booklet in the space provided in the answer sheet by darkening the corresponding circles.
6. Do not use any **eraser, fluid pens** etc., otherwise your answer sheet is likely to be rejected.
7. After completing the test, handover the ANSWER SHEET to the Invigilator.

Code No. 01

PAPER – I

SECTION I

(PHYSICS)

1. A coin placed at the bottom of low height container appears raised when water is poured in the container due to :

   (1) Reflection (2) Mirage effect

   (3) Refraction (4) Dispersion

2. The direction of induced current in a circuit is given by :

   (1) Fleming's right hand rule (2) Amperes swimming rule

   (3) Fleming's left hand rule (4) Right hand thumb rule

3. A.C. is used in homes because :

   (1) it is cheap (2) easily reproducible

   (3) it is economical in transmission (4) safety

4. An electric lamp of resistance 100 Ω, toaster of resistance 50 Ω and a water filter of resistance 500 Ω are connected in parallel to a 220 V source. What is the resistance of an electric iron connected to the same source that takes as much current as all three appliances?

   (1) 31.25 Ω (2) 57 Ω (3) 50 Ω (4) 35 Ω

5. It is a common notion that the earth's magnetic field is due :

   (1) Presence of a huge permanent magnet in the interior of the earth

   (2) Presence of a electric currents circulating in the interior of the earth

   (3) Influence of the sun's magnetic field

   (4) Influence of nuclear explosion

6. Ocean thermal energy is obtained on virtue of :

(1) A difference in the density of the surface and the bottom layers of the ocean

(2) Gravitational pull of moon on the spinning earth

(3) Temperature difference of 293 K or more between atmospheric air and bottom layer of the ocean

(4) Temperature difference of around 293 K or more between water at the surface and water at higher depths

7. Hot spots are :

(1) Certain regions in the earth's crust where molten rocks (formed in deeper hot regions of the crust) are trapped

(2) Formed in the earth's crust due to hot springs

(3) Defects which occur when a hot molten fluid cools to room temperature

(4) None of the above

8. An object is placed at a distance of 10 cm from a convex mirror of focal length 15 cm. The nature of the image will be :

(1) Diminished, virtual and erect (2) Real, virtual and erect

(3) Real and inverted (4) Virtual and inverted

9. Which one of these is not a part of the nuclear reactor?

(1) Moderator (2) Cathode ray tube

(3) Control rods (4) None of the above

10. Which one of these is not a limitation of 'the energy that can be obtained from waves'?

(1) There are very few sites around the world which are suitable for building tidal barrages

(2) Rise and fall of sea water is not enough to generate electricity on a large scale

(3) It produces a large amount of waste

(4) It is an expensive source of energy

11. U-235 is unstable because :

(1) Nuclear force of repulsion is greater than electrostatic force of attraction

(2) It produces radioactive radiations

(3) It possesses a high atomic weight

(4) Electrostatic repulsive force is greater than nuclear force of attraction

12. The radius of curvature of a spherical mirror is 20 cm. It's focal length will be :

(1) 10 cm (2) 20 cm (3) 40 cm (4) 15 cm

13. If a bimetallic strip is heated it will :

(1) Bend towards the metal with lower thermal expansion coefficient

(2) Bend towards the metal with higher thermal expansion coefficient

(3) Not bend at all

(4) Twist itself into a helix

14. Thermal capacity of a body is :

(1) Quantity of heat × specific heat

(2) Mass of body × specific heat

(3) Mass of body × specific heat/specific heat of water

(4) Mass of body/specific heat

15. Magnification of an object is the ratio of :

(1) Size of the image to the size of the object

(2) Size of the object to the size of the image

(3) Focal length to object distance

(4) Image distance to focal length

16. Match the following :

Transfer of heat	*Medium*
(I) Absorption	(A) Solid medium
(II) Conduction	(B) Polished surface
(III) Convection	(C) Black surface
(IV) Radiation	(D) Air
	(E) Vaccum

(1) I–C, II–E, III–D, IV–B (2) I–A, II–C, III–D, IV–B

(3) I–C, II–A, III–D, IV–E (4) I–C, II–D, III–E, IV–B

17. Water is used to cool the radiators of engines in motor cars because of its :

(1) Low density (2) Easy availability

(3) High specific heat (4) Low temperature

18. According to Snell's law :

(1) $\frac{\sin i}{\sin r} = \text{constant}$ (2) $\frac{\sin r}{\sin i} = \text{constant}$

(3) $\frac{\sin i}{\sin r} = 1$ (4) $\frac{\sin i}{\sin r} = 2$

19. Specific heat of a body does not depend on :

(1) Mass of body (2) Temperature rise

(3) Nature of material (4) Coefficient of expansion

20. Conversion of Centigrade into Fahrenheit temperature formula is :

(1) $\frac{C}{100} = \frac{F-32}{180}$ (2) $\frac{C-32}{100} = \frac{F}{180}$

(3) $\frac{C}{180} = \frac{F-32}{100}$ (4) None of the above

21. A person with a myopic eye cannot see objects beyond 1.2 distinctly. The nature of the corrective lens used to restore proper vision is :

(1) Concave lens (2) Cylindrical lens

(3) Convex lens (4) None of the above

22. An electric iron of resistance 20 Ω takes a current of 5 A. Calculate the heat developed in 30 s :

(1) 48000 J (2) 18000 J (3) 3000 J (4) 15000 J

23. Which of the following is not a renewable source of energy?

(1) Wind energy
(2) Solar energy
(3) Nuclear fuel energy
(4) Geothermal energy

24. A person wants to see his full image in plane mirror. Which one of the following sizes is the minimum size required for seeing the full image?

(1) Height of the mirror is twice the height of the person
(2) Height of the mirror is equal to the height of the person
(3) Height of the mirror is half the height of the person
(4) Height of the mirror is one third the height of the person

25. Biomass is :

(1) Cow dung and various plant materials like the residue obtained after harvesting crops
(2) A slurry of cow dung and water
(3) The material contained in the bodies of plants and animals
(4) A starting material for nuclear reactors

26. Breeze has a speed of approximately :

(1) 100 km/hr (2) 5 km/hr (3) 800 km/hr (4) 15 km/hr

27. An electric bulb is rated 220 V and 100 W. When it is operated on 110 V, the power consumed will be :

(1) 100 W (2) 75 W (3) 50 W (4) 25 W

28. What kind of mirror is best suited for use in a solar cooker?

(1) Plane
(2) Concave
(3) Convex
(4) It uses a lens and not a mirror

29. A wire of length 15 m and uniform cross section 6×10^{-7} m^2 has resistance of 5 Ω. The resistivity of the material is :

(1) 2×10^{-7} Ω cm
(2) 3×10^{-7} Ω m
(3) 2×10^{-7} Ω m
(4) None of the above

30. Main constituent of biogas is :

(1) Ethane
(2) Ammonia gas
(3) Methane gas
(4) Nitrogen oxide

31. The process by which the percentage of U-235 in U-238 is increased is called :

(1) Chain reaction
(2) Communition
(3) Fusion
(4) Enrichment

32. Which of the following is used as a neutron moderator in nuclear reactors?

(1) Graphite
(2) Zinc
(3) Thorium
(4) Radium

33. Sun's heat is transmitted to earth by :

(1) Conduction
(2) Heat exchange
(3) Radiation
(4) Conduction and radiation

34. A natural solid fuel is :

(1) Coke
(2) Coal
(3) LPG
(4) CNG

35. A metal sheet with a circular hole is heated. The hole will :

(1) Contract
(2) Remain unaffected
(3) Contract or expand depending on linear expansion coefficient
(4) Expand

SECTION II

(CHEMISTRY)

36. Which is true for a homologous series?

(1) The successive members differ by 14 units of mass

(2) They contain a hydroxyl group

(3) The successive members differ by a CH_4 group

(4) None of these

37. Most of the fuels are :

(1) Carbon compounds with sulphur

(2) Nitrogen compounds with carbon

(3) Carbon compounds with hydrogen

(4) None of these

38. The gas used in the welding and cutting of metals :

(1) Ethane (2) Ethyne

(3) Ethene (4) Propene

39. The compound(s) used as an anti freeze in radiators of automobile is/are :

(1) Methyl alcohol (2) Ethyl alcohol

(3) Ethyl alcohol + water (4) Methyl alcohol + water

40. The difference in the molecular mass of C_2H_5OH and C_3H_7OH is :

(1) 16 (2) 14

(3) 18 (4) None of the above

41. In a highly industrialized area, which of the following will be virtually absent?

(1) Algae (2) Lichens

(3) Ferns (4) Bryophytes

42. ———————— turns lime water milky :

(1) Sodium acetate (2) Oxygen

(3) Methanoic acid (4) Carbon dioxide

43. Which of the following contribute to the carbon cycle?

(1) Photosynthesis (2) Respiration

(3) Fossil fuel combustion (4) All of these

44. Which of these does not belong to a homologous series?

(1) CH_3OH and C_2H_5OH (2) CH_4 and C_2H_6

(3) C_2H_4 and C_3H_6 (4) C_2H_4 and C_3H_8

45. Pollution is an undesirable change in physical, chemical and biological properties of :

(1) Air (2) Water (3) Soil (4) All of these

46. Threat for human existence is :

(1) Low forests (2) High population and pollution

(3) Deforestation (4) High population

47. Air pollution causing photochemical oxidants production include :

(1) Nitrous oxide, nitric acid fumes, nitric oxide

(2) Ozone, peroxyacetyl nitrate, aldehydes

(3) Oxygen, chlorine, fuming nitric acid

(4) Sulphur dioxide

48. Gases referred to as *green house* gases are :

(1) CO_2, O_2, NO_2, NH_3 (2) Chlorofluorocarbon, CO_2, NH_3, N_2

(3) CH_4, N_2, CO_2, NH_3 (4) Chlorofluorocarbon, CO_2, CH_4, NO_2

49. What is the valency of carbon atom in alkane, alkene and alkyne?

(1) 4, 4, 4 (2) 4, 3, 2 (3) 2, 3, 4 (4) 2, 2, 2

50. Minimata disease is a pollution-related disease which results from :

(1) Release of human organic waste into drinking water

(2) Accumulation of arsenic into atmosphere

(3) Release of industrial waste mercury into fishing water

(4) Oil spills into sea

51. If there was no CO_2 in the earth's atmosphere. The temperature of the earth would be :

(1) Higher than the present

(2) Dependent on the amount of oxygen in the atmosphere

(3) Less than the present

(4) The same

52. Acid rain is caused due to increase in concentration of :

(1) SO_2 and NO_2 (2) CO and CO_2

(3) CO and SO_3 (4) Ozone and dust

53. Carbon monoxide is a pollutant because :

(1) Inhibits glycolysis (2) Combines with haemoglobin

(3) Inactivates nerves (4) Combines with oxygen

54. Which is not a green house gas?

(1) CO_2 (2) H_2 (3) Methane (4) CFC

55. Which of the following compounds has a fruity smell?

(1) Alcohols (2) Ethanol

(3) Esters (4) None of these

56. Pollutant from motor car exhaust that causes mental diseases is :

(1) Lead (2) NO_2

(3) SO_2 (4) Mercury

57. Which of the following type of pollution causes outbreak of jaundice?

(1) Air pollution (2) Water pollution

(3) Soil pollution (4) Thermal pollution

58. The number of isomers for pentane is :

(1) 2 (2) 3

(3) 4 (4) 5

59. Deforestation has an alarming effect on :

(1) Increase in grazing area (2) Weed control

(3) Soil erosion (4) Sunlight

60. While cooking, if the bottom of the vessel is getting blackened on the outside, means :

(1) The food is not cooked completely

(2) The fuel is wet

(3) The fuel is not burning completely

(4) The fuel is burning completely

61. Which of the following is a fossil fuel?

(1) Coal gas (2) Natural gas (3) Bio gas (4) Producer gas

62. If the density of kerosene is 800 kg/m^3, then its specific gravity is :

(1) 80 (2) 800 (3) 0.8 (4) $\frac{1}{800}$

63. Consider the following :

I. Heavy water II. Sea water III. Hard water

Which of the above may be a mixture?

(1) I, II and III (2) I and II (3) II and III (4) I and III

64. Carbon dioxide and oxygen balance in atmosphere is due to :

(1) Photorespiration (2) Photosynthesis

(3) Respiration (4) Leaf anatomy

65. What is the chemical formula of chloroform?

(1) $CHCl_3$ (2) CCl_4 (3) CH_2Cl_2 (4) CH_3Cl

66. An unsaturated hydrocarbon contains :

(1) 6 carbon atoms

(2) Fewer hydrogen atoms than is needed for carbon to have its usual valency of 4

(3) Excess hydrogen atoms

(4) A chain of carbon atoms

67. Burning of fossil fuels is the main cause of :

(1) Nitrogen oxide pollution (2) Nitrous oxide pollution

(3) SO_2 pollution (4) Nitric oxide pollution

68. Ultraviolet radiation from sunlight causes the reaction that produces :

(1) SO_2 (2) CO (3) Ozone (4) Fluorides

69. In the recent years there has been an increase in the incidence of floods in the plains of northern India because :

(1) There has been an increase in annual rainfall

(2) The rate of silting of dams has gone up

(3) There has been increased deforestation in the catchment areas

(4) Increased areas of land is being self cultivated

70. Which of the following is the main factor in water pollution?

(1) Pesticides (2) Industrial waste

(3) Detergent (4) NH_3

Space For Rough Work

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SEAL