NEW STANDARD ACADEMY

Test Type : Unit Test - 02 11-08-2025

Do not open this Test Booklet until you are asked to do so.

PRE-MEDICAL :12th Undergoing/Pass Students

Read carefully the Instructions on the Back Cover of this Test Booklet.

Important Instructions :

1. On the answer sheet, fill in the particulars on Side-1 and Side -2 carefully with blue/black ball point pen only.
2. The test The test is of 3 hours 20 minutes duration and this Test Booklet contains 200 questions. Each question carries 4 marks. For each correct response, the candidate will get 4 marks. For each incorrect response, one mark will be deducted from the total scores. The maximum marks are 720.
3. In this Test Paper, each subject will consist of two sections. Section A will consist of 35 questions (all questions are mandatory) and Section B will have15 questions. Candidate can choose to attempt any 10 question out of these 15 questions. In case if candidate attempts more than 10 questions, first 10 attempted questions will be considered for marking
4. In case of more than one option correct in any question, the best correct option will be considered as answer.
5. Use Blue/Black Ball Point Pen only for writing particulars on this page/marking responses.
6. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
7. On completion of the test, the candidate must hand over the Answer Sheet to the Invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.
8. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Form No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
9. Use of white fluid for correction is not permissible on the Answer Sheet.

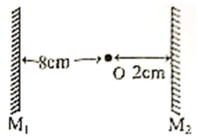
Name of the Candidate(In Capitals) _____

Date of Examintation _____

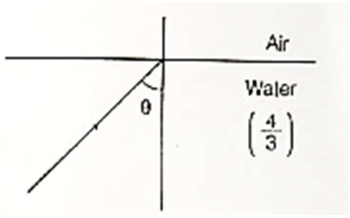
Candidate`s Signature:_____ Invigilator`s Signature: _____

(PHYSICS)

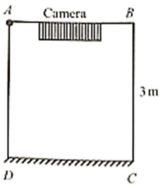
1. A ray of light makes an angle of 20º with the horizontal and strikes a plane mirror which is inclined at an angle θ to the horizontal. The angle θ for which the reflected ray becomes vertical is
   (a) 40° (b) 80°
   (c) 35° (d) 100°
2. Given figure shows two plane mirrors and an object O placed between them. What will be distance of the first three images from the mirror M_2?



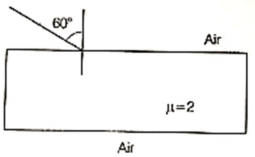
   (a) 2 cm, 8 cm, 14 cm
   (b) 2 cm, 12 cm, 18 cm
   (c) 2 cm, 18 cm, 22 cm
   (d) 2 cm, 24 cm, 38 cm
3. In the given figure, if θ =53°, the angle of deviation is



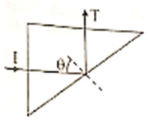
   (a) 74° (b) 53°
   (c) 106° (d) 90°
4. Figure shows a cubical room ABCD with the wall CD as a plane mirror. Each side of the room is 3m. We place a camera at the midpoint of the wall AB. At what distance should the camera be focussed to photograph of image of an object placed at A?



   (a) 1.5m (b) 3 m
   (c) 6 m (d) 6.18 m
5. A ray of light is incident on a slab of refractive index μ= 2 at an angle of incidence 60º as shown in the figure. The thickness of slab is 1 m. The lateral shifting in the ray is



   (a) 1m (b) 0.5 m
   (c) $\left(\frac{\sqrt{39}-\sqrt{3}}{2\sqrt{13}}\right)$m (d) 0.8 m
6. The refracting angle of a prism is 40°. A ray of light is incident at angle 38° and passes in the position of minimum deviation. The angle of minimum deviation is
   (a) 40° (b) 38°
   (c) 36° (d) 32°
7. A triangular prism of glass is shown in figure. A ray incident normal to one face is totally internally reflected. If θ is 45°, then index of refraction of the glass is



   (a) less than 1.41 (b) equal to 1.41
   (c) greater then 1.41 (d) none of these
8. The refractive index for the material of a 60° prism is 1.50. Further sin 42° ≈ 2/3 and sin 49° ≈3/4 Then the angle of incidence for minimum deviation is nearly
   (a) 30° (b) 49°
   (c) 38° (d) 28°
9. A prism of refractive index $\sqrt{2}$ and refracting angle A produces minimum deviation δ_m of a ray on one face at an angle of incidence 45°, The values of A and δ_m respectively, are
   (a) 45°, 45° (b) 45°, 60°
   (b) 60°, 30° (d) 60°, 45°
10. A parallel beam of monochromatic light is incident on one face of an equilateral prism, the angle of incidence being 55°. The angle of emergence of the beam from the other face is 46°. The angle of minimum deviation is
    (a) less than 41° (b) equal to 41°
    (c) greater than 41°
    (d) greater than of equal to 41°
11. A ray of light passes through an equilateral glass prism in such a manner that the angle of incidence is equal to the angle of emergence and each of these angles is equal to (3/4) of the angle of prism. The angle of deviation is
    (a) 40° (b) 70°
    (c) 39° (d) 30°
12. The focal length of a convex lens of glass (μ = 1.5) is 2 cm. The focal length of the lens when immersed in a liquid of refractive index 1.25 will be
    (a) 5cm (b) 2.4 cm
    (c) 1 cm (d) 4cm
13. A luminous point object is moving along the principal axis of a concave mirror of focal length

12 cm towards it. When its distance from the mirror is 20 cm its velocity is 4 cm/s. The velocity of the image in cm/s at that instant is
(a) 6, towards the mirror
(b) 6, away from the mirror
(c) 9, away from the mirror
(d) 9, towards the mirror

14. An object is kept at a distance of 16 cm from a thin lens and the image formed is real. If the object is kept at a distance of 6 cm from the same lens the image formed is virtual. If the size of the images formed are equal, the focal length of the lens will be
(a) 8 cm (b) 5 cm
(c) 11 cm (d) √96 cm
15. It is desired to photograph the image of an object placed at a distance of 3 m from a plane mirror. The camera, which is at a distance of 4.5 m from the mirror, should be focused for a distance of
(a) 3 m (b) 4.5 m
(c) 6 m (d) 7.5 m

CHEMISTRY

16. The correct order of magnetic moments (spin only values in B.M.) among is
(a) $Fe(CN)_6]^{4-} > [MnCl_4]^{2-} > [CoCl_4]^{2-}$
(b) $[MnCl_4]^{2-} > [Fe(CN)_6]^{4-} > [CoCl_4]^{2-}$
(c) $[MnCl_4]^{2-} > [CoCl_4]^{2-} > [Fe(CN)_6]^{4-}$
(d) $[Fe(CN)_6]^{4-} > [CoCl_4]^{2-} > [MnCl_4]^{2-}$
17. The species having tetrahedral shape is
(a) $[PdCl_4]^{2-}$ (b) $[Ni(CN)_4]^{2-}$
(c) $[Pd(CN)_4]^{2-}$ (d) $[NiCl_4]^{2-}$
18. Hybridisation of Ni in $Ni(CO)_4$ is
(a) dsp^2 (b) dsp^3
(c) d^2sp^3 (4) sp^3
19. fac-mer isomerism is associated with which one of the following complexes? [M = central metal]
(a) $[M(AA)_2]$ (b) $[MA_3A_3]$
(c) $[M(AA)_3]$ (d) [MABCD]
20. Which one of the following is tridentate ligand?
(a) NO_2^- (b) oxalate ion
(c) glycinate ion (d) dien
21. Which has tetrahedral geometry?
(a) $[Ni(CN)_4]^{2-}$ (b) $[Pd(CN)_4]^{2-}$
(c) $[PdCl_4]^{2-}$ (d) $[NiCl_4]^{2-}$
22. The magnetic moment (spin only) of $[NiCl_4]^{2-}$
(a) 2.82 BM (b) 1.41 BM
(c) 1.82 BM (d) 5.46
23. Which one of the following complex ions has geometrical isomers?
(a) $[Co(en)_3]^{3+}$ (b) $[Ni(NH_3)_5Br]^+$
(c) $[Co(NH_3)_2(en)_2]^{3+}$ (4) $[Cr(NH_3)_4(en)]^{3+}$
24. The IUPAC name of $K_2[Ni(CN)_4]$ is
(a) Potassium tetracyanonickelate(II)
(b) Potassium tetracyanatonickelate(III)
(c) Potassium tetracyanatonickel(II)
(d) Potassium tetracyanonickel(III)
25. Which of the following ligands is classified as ambidentate ligand?
(a) NH_3 (b) EDTA
(c) H_2O (d) SCN^-
26. The tetrahedral crystal field splitting is only _____ of the octahedral splitting
(a) 1/9 (b) 2/9
(c) 4/9 (d) 5/9

READ THE STATEMENTS CAREFULLY TO MARK THE CORRECT OPTION OUT OF THE OPTIONS GIVEN BELOW
(a) If both statements are true and Reason is the correct explanation of Assertion.
(b) If both statements are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If Assertion is false but Reason is true.

27. **Assertion:** trans$[CoCl_2(en)_2]^+$ is optically inactive
Reason: It has a plane of symmetry
28. **Assertion:** cis $[Fe(en)_2Cl_2]^+$ can form recemic mixture
Reason: cis - $[Fe(en)_2Cl_2]^+$ is square planar complex
29. **Assertion:** $CrCl_3 3H_2O$ is non-conductive
Reason: All the three Cl^- ions are in the coordination sphere
30. **Assertion:** $[Ni(CN)_4]^{-2}$ has zero unpaired electron while that of $[NiCl_4]^{-2}$ has two unpaired
Reason: $[Ni(CN)_4]^{-2}$ has strong crystal field while $[NiCl_4]^{-2}$ has weak crystal field

BIOLOGY

31. The trigger for activation of toxin of Bacillus thuringiensis is
(a) Acidic pH of stomach
(b) High temperature
(c) Alkaline pH of gut
(d) Mechanical action in the insect gut
32. The main technique involved in agricultural biotechnology is called
(a) Tissue culture (b) Transformation
(c) Plant breeding (d) DNA replication
33. Cultivation of Bt cotton has been much in the news. The prefix 'Bt' means
(a) 'Barium treated' cotton seeds
(b) 'Bigger thread' variety of cotton with better tensile strength
(c) Produced by 'biotechnology' using restriction enzymes and ligases
(d) Carrying an endotoxin gene from Bacillus thuringiensis.

34. Golden rice is a transgenic crop of the future with the
(a) Insect resistance
(b) High lysine (essential amino acid) content
(c) High protein content
(d) High vitamin A content.
35. What is true about Bt toxin?
(a) Bt toxin exists as active toxin in the Bacillus
(b) The activated toxin enters the ovaries of the pest to sterilise it and thus prevents its multiplication.
(c) The concerned Bacillus has anti-toxins.
(d) The inactive prototoxin gets converted into active form in the insect gut..
36. Transgenic plants are the ones
(a) Generated by introducing foreign DNA into a cell and regenerating a plant from the cell.
(b) Produced after protoplast fusion in artificial medium
(c) Grown in artificial medium after hybridization in the field
(d) Produced by a somatic embryo in artificial medium
37. The introduction of RNA interference gene in tobacco plants
(a) Provided resistance to plant against the attack of Agrobacterium
(b) Made the plant resistant against all types of pathogens
(c) Helped in preventing the loss in yield of plant.
(d) Developed a commensal relationship between the plant and nematode Meloidogyne
38. RNA interference (RNAi) technique has been devised to protect the plants from the nematode. In this technique, mRNA of nematode is silenced by_____ produced by the host plant.
(a) dsDNA (b) ssDNA
(c) dsRNA (d) Target proteins
39. Which of the following cry gene codes for the protein which can control the corn borer effectively?
(a) Cry I Ac (b) Cry II Ab
(c) Cry1Ab (d) Cry II Ac
40. Production of Bt cotton was done by
(a) Insertion of an inactive cry gene in cotton
(b) Making boll worms resistant against Bt toxin
(c) Making the cotton plant an insecticide
(d) Introduction of cry I Ab in cotton
41. Match Column I with Column II and select the correct option

Column I	Column II
1. Flavr Savr	(i) Saved additional labour of farmers
2. Golden rice	(ii) Natural insecticide
3. Bt corn	(iii) Antisense technique
4. Herbicide resistant	(iv) Nutrient enrichment Crops

(a) 1-(i), 2-(ii), 3-(iii), 4-(iv)
(b) 1-(iii), 2-(ii), 3-(i), 4-(iv)
(c) 1-(iii), 2-(iv), 3-(ii), 4-(i)。
(d) 1-(iv), 2-(i), 3-(iii), 4-(ii)
42. What is an explant?
(a) Part of the plant that expresses a specific gene
(b) Part of the plant used in tissue culture.
(c) Dead plant
(d) All of these
43. Bt cotton does not
(a) Kill insect pests
(b) Contain Cry II Ac
(c) Provide alkaline medium for prototoxin
(d) Affect the yield of cotton
44. Several nematodes parasitise a
(a) Wide variety of plants
(b) Wide variety of animals
(c) Wide variety of animals including human beings
(d) All of the above
45. How many varieties of rice has been estimated to be present in India?
(a) 2,000 (b) 20,000
(c) 200,000 (d) 2,00,000
46. Which of the following is not a recombinant protein used in medical practice?
(a) TPA (tissue plasminogen activator)
(b) Interferon (α, βand γ)
(c) Vaccine (for hepatitis B)
(d) Heparin
47. First biochemical to be produced commercially by microbial cloning and genetic engineering is
(a) Human insulin. (b) Penicillin
(c) Interferons (4) Fertility factor
48. GEAC stands for
(a) Genome Engineering Action Committee
(b) Ground Environment Action Committee
(c) Genetic Engineering Approval Committee.
(d) Genetic and Environment Approval committee
49. The first clinical gene therapy was given in 1990 to a 4-year-old girl with
(a) Haemophilia
(b) Adenosine deaminase (ADA) deficiency.
(c) Lysosomal deficiency
(d) Phenylalanine hydroxylase (PHA) deficiency
50. Transgenic rats, rabbits, pigs, sheep, cows and fish have been produced Almost over 95 per cent of all existing transgenic animals are

(a) Sheep (b) Fish
(c) Mice (d) Pigs

51. Insulin consists of two short polypeptide chains: chain A and chain B, that are linked together by
(a) H bonds (b) Peptide bonds
(c) Ionic bonds (d) Disulphide bridges
52. Transgenic ____ are being used to test the safety of the polio vaccine
(a) Cow (b) Mice
(c) Sheep (d) Goat
53. Eli Lilly an American company prepared two DNA sequences corresponding to A and B, chains of human insulin and introduced them in plasmids of E. coli to produce insulin chains. Chains A and B were produced separately, extracted and combined by creating
(a) Peptide bonds (b) Ionic bonds
(c) H-bonds (d) Disulphide bonds
54. Amniocentesis is a technique misused for
(a) Estimating amino acid content of the amnion
(b) Determining the sex of the foetus
(c) Measuring the size of the amnion
(d) Determining the position of the foetus
55. The technique using fluid around foetus in detection of prenatal disorders is
(a) Endoscopy (b) Amniocentesis
(c) Laparoscopy (d) Natal endoscopy
56. Which of the following technique is banned in India?
(a) USG (b) Sterilization
(c) Amniocentesis (d) IVF
57. Main problem of India is its
(a) Reproductive health
(b) Education
(c) Excess population
(d) People health
58. Marriageable age in India is (in years)
(a) Male 15 and female 16
(b) Male 25 and female 20
(c) Male 18 and female 21
(d) Male 21 and female 18
59. The best way to decrease population of a country is
(a) To educate people
(b) To have better houses
(c) To kill people on a large scale
(d) To practice and implement family planning
60. Higher population in cities is mainly due to
(a) More opportunities for education
(b) Availability of clean drinking water
(c) Better sanitation
(c) Higher income resources
61. Rapid decline in a population due to high mortality rate is called
(a) Population density
(b) Population crash
(c) Population explosion
(b) All of these
62. A contraceptive is
(a) Condom, cervical cap or diaphragm
(b) Intrauterine device
(c) Pill
(d) All of the above
63. Which of the following method of contraception has least side effect?
(a) IUD
(b) Pills
(c) Coitus interruptus
(d) Cervical cap
64. During coitus, diaphragms, cervical caps and vaults are barriers that are inserted into the female reproductive tract to cover the
(a) Vagina (b) Vaginal orifice
(c) Cervix (d) Fallopian tubules
65. The function of oral contraceptive pill is to
(a) Inhibit ovulation
(b) Inhibit implantation
(c) Alter the quality of cervical mucus to prevent/retard entry of sperms
(d) All of the above
66. What is the function of copper-T?
(a) Stops cleavage
(b) Stops implantation
(c) Checks mutation
(d) Stops gastrulation
67. The abbreivation MTP stands for
(a) Multi-trade Practices
(b) Malthusian Treatise on Population
(c) Multiple Temporary Frequency
(d) Medical Termination of Pregnancy
68. HIV attacks
(a) RBCs
(b) Blood platelets
(c) Helper T cells
(d) B-cells
69. Which of the following is not a type of assisted reproductive technology?
(a) GIFT (b) MTP
(c) ICSI (d) ZIFT
70. The technique in which sperm is directly injected into egg is
(a) ICSI (b) IUI
(c) IVF (d) ART