NATIONAL COMPETATIVE POTENTIAL ASSESMENT

[Question paper is to be returned along with bubble sheet]

ICAD Creating & Nurturing Talent

Standard: **VIII (Eighth)** *Time Allowed* : **2 Hrs.**

Date of Test: *Maximum Marks* : **240**

Student's Name: _____ *Roll No.* : | | | | | | |

NOTE:
1. There are 4 Sections (1) **Physics - 20 Q.** (2) **Chemistry - 20 Q.** (3) **Mathematics - 20 Q.** (4) **Biology - 20 Q.**
2. There are four options for each question; however only one is correct answer.
3. There is negative marking scheme (3R-1W). Which means that for correct answer 3 mark will be awarded & for wrong answer 1 mark will be deducted. No mark will be deducted for unanswered question.
4. Use black ball point pen only.
5. Darken only one bubble completely, corresponding to the correct option.
6. Do not cancel the filled bubble or darken more than one bubble. It will be treated as wrong answer.
7. You may do rough work on the last blank page.

PHYSICS

CHOOSE THE CORRECT OPTION:

01. In a particular system of unit, if the unit of mass becomes twice & that of time becomes half, then 8 Joules will be written as _____ unit of work.
(a) 16 **(b)** 1 **(c)** 4 **(d)** 64

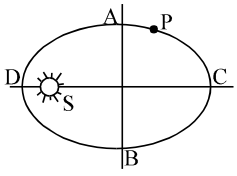
02. Suppose a player hits several baseballs. Which baseball will be in the air for the longest time?
(a) The one with the farthest range.
(b) The one which reaches maximum height.
(c) The one with the greatest initial velocity.
(d) The one leaving the bat at 45° with respect to the ground.

03. A stone is released from an elevator going up with an acceleration a. The acceleration of the stone after the release is
(a) a upward **(b)** (g – a) upward
(c) (g – a) downward **(d)** g downward

04. A satellite of the earth is revolving in circular orbit with a uniform velocity V. If the gravitational force suddenly disappears, the satellite will
(a) continue to move with the same velocity in the same orbit.
(b) move tangentially to the original orbit with velocity V.
(c) fall down with increasing velocity.
(d) come to a stop somewhere in its original orbit.

For Q.No.5

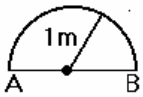
Figure shows the orbit of a planet P round the sun S. AB and CD are the minor and major axes of the ellipse.



05. If t_1 is the time taken by the planet to travel along ACB and t_2 the time along BDA, then
(a) $t_1 = t_2$ **(b)** $t_1 > t_2$ **(c)** $t_1 < t_2$
(d) nothing can be concluded

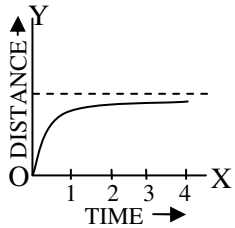
06. A particle has displacement 12 cm towards east and 9 cm towards north and then 8 cm vertically upward. The magnitude of sum of these displacements is
(a) 17 cm **(b)** 20 cm **(c)** 29 cm **(d)** none

07. In 1.0 s a particle goes from point A to point B, moving in a semicircle of radius 1.0 m as shown in figure. Then the magnitude of average velocity is



(a) π m/s **(b)** 2π m/s **(c)** 1 m/s **(d)** 2 m/s

08. The displacement of a particle is a function of time as shown in figure. The figure indicates that



(a) the particle starts with a certain velocity, but the motion is retarded and finally the particle stops.
(b) the velocity of the particle is constant throughout.
(c) the acceleration of the particle is constant throughout.
(d) the particle starts with a certain velocity, the motion is accelerated and finally the particle moves with another velocity.

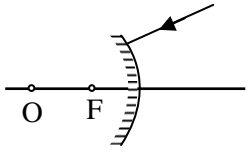
09. On a stationary sail boat, air is blown at the sails from a fan attached to the boat. The boat will
(a) move forward **(b)** move backward
(c) spin around **(d)** remain stationary

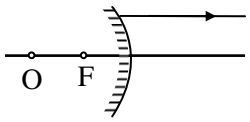
10. **Assertion (A):** When a man jumps from a boat to the shore, the boat slightly moves away from the shore.
Reason (R): The total momentum of the boat and the man remains conserved.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true but R is false.
(d) Both A and R is false.

11. If the momentum of a body is made $1/n$ times, the kinetic energy becomes …….. times the original.
(a) n^2 **(b)** n **(c)** $1/n$ **(d)** $1/n^2$

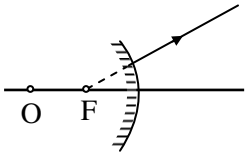
12. A faulty thermometer has fixed points marked 5 and 95. What is the correct temperature in ºC when this thermometer reads 59?
(a) 59ºC **(b)** 60ºC **(c)** 54ºC **(d)** none

13. A ray of light falls on a convex mirror, as shown in figure. Trace the path of the ray further.

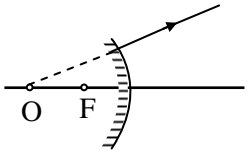




(a)



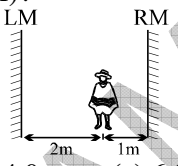
(b)



(c) **(d)** none of these

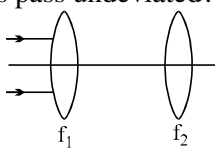
14. Two plane mirrors are inclined at 70º. A ray incident on one mirror at angle θ after reflection falls on the second mirror and is reflected from there parallel to the first mirror, θ is
(a) 50º **(b)** 45º **(c)** 30º **(d)** 55º

15. Two mirrors, labelled LM for left mirror and RM for right mirror in the adjacent figure, are parallel to each other and 3.0 m apart. A person standing 1.0 m from the right mirror (RM) looks into this mirror and sees a series of images. How far from the person is the second closest image seen in the right mirror (RM)?



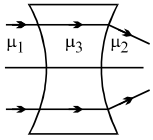
(a) 10.0 m **(b)** 4.0 m **(c)** 6.0 m **(d)** 8.0 m

16. Parallel beam of light is incident on a system of two convex lenses of focal lengths $f_1 = 20$ cm and $f_2 = 10$ cm. What should be the distance between the two lenses so that rays after refraction from both the lenses pass undeviated?



(a) 60 cm **(b)** 30 cm **(c)** 90 cm **(d)** 40 cm

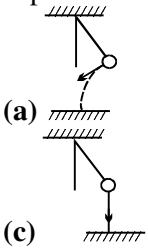
17. From the figure shown establish a relation between μ_1, μ_2 and μ_3.



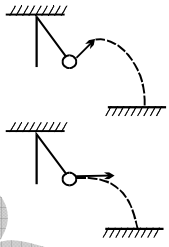
(a) $\mu_1 < \mu_2 < \mu_3$ **(b)** $\mu_3 < \mu_2$; $\mu_3 = \mu_1$
(c) $\mu_3 > \mu_2$; $\mu_3 = \mu_1$ **(d)** none

18. Suppose there is a hole is a copper plate. Upon heating the plate, diameter of hole, would
(a) always increase
(b) always decrease
(c) always remain the same
(d) none

19. A pendulum bob is swinging in a vertical plane such that its angular amplitude is less than 90º. At its highest point, the string is cut. Which trajectory is possible for the bob afterwards?



(a)



(b)

(c)

(d)

20. Two racing cars of masses m_1 and m_2 are moving in circles of radii r_1 and r_2 respectively. Their speeds are such that each makes a complete circle in the same time t. The ratio of the angular speeds of the first to the second car is
(a) 1 : 1 **(b)** $m_1 : m_2$ **(c)** $r_1 : r_2$ **(d)** $m_1 m_2 : r_1 r_2$

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CHEMISTRY

CHOOSE THE CORRECT OPTION:

21. The atoms of same element having different physical properties, but same chemical properties are called
(a) Isobars **(b)** allotropes
(c) Isotopes **(d)** none of these

22. Alpha particles consist of
(a) 2 protons & 3 neutrons
(b) 2 protons & 1 neutron
(c) 2 protons & 2 neutrons
(d) 1 protons & 2 neutrons

23. The radioactive isotope use in the cure of thyroid cancer is
(a) P-32 **(b)** Co-60 **(c)** Na-24 **(d)** I-131

24. An element 'X' has the same mass number and atomic number. This element is …
(a) inert gas **(b)** hydrogen
(c) alpha particle **(d)** Helium

25. Which of the following has more electrons than neutrons
(a) $Na^+ ({}_{11}Na^{23})$ **(b)** $Mg^{+2} ({}_{12}Mg^{24})$
(c) $O^{-2} ({}_{8}O^{16})$ **(d)** $Al^{+3} ({}_{13}Al^{27})$

26. An atom or a group of atoms is said to be oxidising agent if it
(a) loses electrons
(b) gains electrons
(c) neither loses nor gains electrons
(d) none of these

27. Match the following examples in set A with physical state given in set B.

Set A	Set B
1) Plasma	(A) mercury – a metal
2) Solid	(B) methane
3) Liquid	(C) dry ice
4) Gas	(D) core of the sun

(a) 1-D, 2-A, 3-C, 4-B **(b)** 1-D, 2-B, 3-A, 4-C
(c) 1-D, 2-C, 3-A, 4-B **(d)** 1-B, 2-A, 3-C, 4-D

28. Pure substances can be identified by finding their
(a) boiling point & melting point
(b) colour
(c) weight
(d) volume

29. Match the changes in Set A with the type of change in Set B.

Set A	Set B
1) Curdling of milk	(A) physical change
2) Evaporation of water	(B) chemical change
3) Moderate heating of iron	(C) physical & chemical change
4) Burning sulphur	(D) no change

(a) 1-B, 2-A, 3-D, 4-C **(b)** 1-A, 2-B, 3-C, 4-D
(c) 1-B, 2-C, 3-D, 4-A **(d)** 1-C, 2-D, 3-A, 4-B

30. Match the metal in Set A with the flame colour it imparts in Flame Test in Set B.

Set A	Set B
1) Zinc	(A) gold
2) Sodium	(B) brilliant white
3) Iron	(C) bluish-green
4) Magnesium	(D) bright yellow

(a) 1-D, 2-C, 3-A, 4-B **(b)** 1-C, 2-D, 3-A, 4-B
(c) 1-C, 2-D, 3-B, 4-A **(d)** 1-C, 2-A, 3-D, 4-B

31. $Na_2C_2O_4$ is the formula of sodium
(a) carbonate **(b)** oxalate
(c) formate **(d)** acetate

32. Match the formula of the compounds in Set A with their names in Set B.

Set A	Set B
1) $(NH_4)_2CO_3$	(A) Ammonium oxalate
2) $HCOONH_4$	(B) Ammonium acetate
3) $(NH_4)_2C_2O_4$	(C) Ammonium formate
4) CH_3COONH_4	(D) Ammonium carbonate

(a) 1-D, 2-C, 3-A, 4-B **(b)** 1-C, 2-D, 3-A, 4-B
(c) 1-C, 2-D, 3-B, 4-A **(d)** 1-C, 2-A, 3-D, 4-B

33. The substance that is reduced in the reaction $SO_2 + 2H_2S \rightarrow 2H_2O + 3S$ is
(a) Sulphur dioxide
(b) Hydrogen sulphide
(c) Both (a) and (b)
(d) No reduction takes place

34. Rust formation is an example of
(a) Chemical combination reaction
(b) Chemical decomposition reaction
(c) Chemical displacement reaction
(d) Chemical double decomposition reaction

35. Copper sulphate cannot be stored in Iron containers. The reason for this is
(a) Copper is more reactive than Iron
(b) Iron is more reactive than Copper
(c) Iron rusts
(d) The statement is not true

36. Anamalous pair among the following is
(a) B - Si **(b)** Al - Ni **(c)** Be - In **(d)** Co - Ni

37. The pair of atomic number which belongs to the same group
(a) 9, 14 **(b)** 17, 51 **(c)** 6, 53 **(d)** 12, 56

38. Number of elements present in 5^{th} period is
(a) 18 **(b)** 8 **(c)** 32 **(d)** 24

39. The formula of the nitride of a trivalent metal M will be
(a) M_2N_3 **(b)** M_3N_2 **(c)** MN **(d)** M_3N

40. The formula of the compound formed by an element, M in Group 13 (three valence electrons) with an element X in Group 17 (seven valence electrons) will be
(a) MX **(b)** M_2X_3 **(c)** MX_3 **(d)** MX_2

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MATHEMATICS

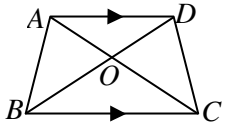
CHOOSE THE CORRECT OPTION:

41. If the height of a cone is doubled, then its volume is increased by:
(a) 100% **(b)** 200% **(c)** 300% **(d)** 400%

42. If $\frac{3x}{4} - 2 = 4$ then $x = ?$
(a) $\frac{14}{3}$ **(b)** 8 **(c)** 6 **(d)** $\frac{15}{3}$

43. There are 28 mango trees, 42 apple trees and 21 orange trees have to be planted in rows such that each row contains the same number of trees of one variety only, then minimum number of rows in which the above trees may be planted is:
(a) 13 **(b)** 12 **(c)** 11 **(d)** 10

44. In the adjoining figure, *ABCD* is a trapezium in which *BC* ∥ *AD* and its diagonals intersect at *O*. If *AO* = (3*x* – 1), *OC* = (5*x* – 3), *BO* = (2*x* +1) and *OD* = (6*x* – 5) then *x* is equal to



(a) 1 **(b)** 2 **(c)** 3 **(d)** 4

45. $\sqrt{x} = \sqrt{31 + \sqrt{18 + \sqrt{49}}}$ $\therefore x = ?$
(a) 36 **(b)** 6 **(c)** 98 **(d)** 1296

46. 0.00000000027 = ?

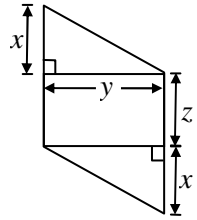
(a) 2.7×10^{-11} **(b)** 2.7×10^{-12}

(c) 2.7×10^{-10} **(d)** 2.7×10^{11}

47. The unit digit in the product $(7^{71}\times6^{59}\times3^{65})$ is:

(a) 6 **(b)** 2 **(c)** 4 **(d)** 1

48. Area of the adjoining figure is ….



(a) $(x^2+y^2+z^2)$ **(b)** $(xy+xy)$

(c) $(\frac{1}{2}xy+yz)$ **(d)** $y(x+z)$

49. If $x=\sqrt{\frac{7+4\sqrt{3}}{7-4\sqrt{3}}}$, then $x^2(x-14)^2$ = ……..

(a) 1 **(b)** – 1 **(c)** 2 **(d)** – 2

50. $\frac{x^2+2x-15}{x+5}=x-3$, for what value of x, the equation will be satisfied?

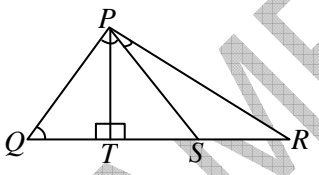
(a) $x=5$ **(b)** $x=-5$

(c) $x=3$ **(d)** any value of x

51. $2^a\times2^{a+1}=32$ then $a=?$

(a) 5 **(b)** 4 **(c)** 3 **(d)** 2

52. In ΔPQR, PS is the bisector of $\angle P$ and $PT\perp QR$, then $\angle TPS$ is equal to:



(a) $\angle Q+\angle R$ **(b)** $90+\frac{1}{2}\angle Q$

(c) $90-\frac{1}{2}\angle R$ **(d)** $\frac{1}{2}(\angle Q-\angle R)$

53. 8.5 decimeter × 9.5 decametre = ……. cm^2

(a) 80705 **(b)** 807.5

(c) 807500 **(d)** 8075

54. $\sqrt{\left(\frac{8}{15}+\frac{15}{8}\right)\div\frac{5}{6}}=?$

(a) 0.017 **(b)** 2.89 **(c)** 1.70 **(d)** 28.9

55. In which triangle the concurrency point of perpendicular bisectors of the sides lie on the side itself.

(a) Acute angled triangle **(b)** Obtuse angled triangle

(c) Right angled triangle **(d)** Equilateral triangle

56. Speed of the boat is 5km/hour. How much distance will it cover in 5 hours if it is traveling upstream in a stream with a speed 3 km/hour?

(a) 8 **(b)** 10 **(c)** 15 **(d)** 25

57. If $x=2+2^{1/3}+2^{2/3}$, then x^3-6x^2+6x = ……

(a) 2 **(b)** 1 **(c)** 4 **(d)** 3

58. $\frac{576m^2-729n^2}{3(8m-9n)}=?$

(a) $(24m+27n)$ **(b)** $8m+9n$

(c) $8m-9n$ **(d)** none of these

59. $\frac{7}{4}+\frac{4}{5}\div\frac{8}{15}-\frac{9}{4}\times\frac{2}{3}=?$

(a) $\frac{2}{3}$ **(b)** $\frac{3}{2}$ **(c)** $\frac{4}{7}$ **(d)** $\frac{7}{4}$

60. If $6a^2b$, $9a^3$, $8b^3$ and x are in proportion what is x?

(a) $12ab^2$ **(b)** $\frac{27a^3}{4b^3}$ **(c)** $\frac{24b^2}{4b^3}$ **(d)** $16a^3b^2$

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BIOLOGY

CHOOSE THE CORRECT OPTION:

61. The highest fat content is found in the milk of

(a) Camel **(b)** Cow **(c)** Buffalo **(d)** Reindeer

62. Which one of the following strongly threatens biodiversity?

(a) Destruction of natural habitats and vegetation and shifting cultivation

(b) Inaccessible habitats in the Himalayas

(c) Fragile ecosystems such as mangroves and wetlands

(d) Creation of biosphere reserves

63. Temperature in human beings is controlled by

(a) Hypothalamus gland **(b)** Thyroid gland

(c) Pituitary gland **(d)** Adrenal gland

64. A person walking barefooted in a field feels a sharp sting and on examination two puncture marks are found on his leg. He is most probably bitten by

(a) Scorpion **(b)** Non-poisonous snake

(c) Poisonous snake **(d)** Rat

65. Meristematic tissues of plants include

(a) Mature fruits, tips of stem and root, cork cambium

(b) Stem and root tips, vascular cambium, cork cambium

(c) Vascular cambium, cork cambium, tips of mature leaves

(d) Tips of mature leaves and mature fruits

66. Haemophilia is a hereditary disease carried by

(a) Males and expressed by females

(b) Females and expressed by males

(c) Females and expressed by females

(d) Males and expressed by males

67. Which one of the following organism is likely to show the highest concentration of DDT once it has been introduced into the ecosystem?
(a) Snake **(b)** Toad
(c) Grasshopper **(d)** Cattle

68. Cytokinins are byproducts of
(a) Fat metabolism
(b) Protein metabolism
(c) Carbohydrate metabolism
(d) Nucleic acid metabolism

69. Rennin and lactase, the enzymes required to digest milk, disappear in the human body by the age of
(a) Five **(b)** Three **(c)** Two **(d)** Eight

70. Dorsiventral leaf has
(a) spongy parenchyma on upper side
(b) spongy parenchyma on both sides
(c) palisade parenchyma on lower side
(d) palisade parenchyma on upper side

71. Rabies is caused by a
(a) Bacteria and it affects the nervous system
(b) Virus and it affects the cardiovascular system
(c) Virus and it affects the nervous system
(d) Bacteria and it affects the cardiovascular system

72. Some medicines are given in the form of capsules. The capsules are mode of
(a) Embryonic tissue **(b)** Gelatinous material
(c) Paper **(d)** Starch

73. Which one of the following is a membrane that protects the developing embryo from desiccation?
(a) Chorion **(b)** Allantois
(c) Amnion **(d)** Yolk sac

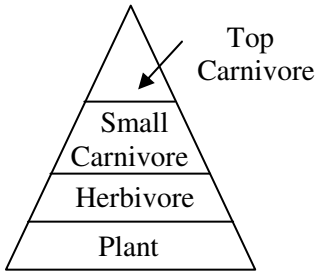
74. Which one of the following statements regarding starch and cellulose is NOT correct?
(a) Both of them give colour with iodine
(b) Both of them are polymers
(c) Both of them are of plant origin
(d) Both of them are made up of glucose molecules

75. What is tissue culture?
(a) Name given to a special type of surgery
(b) Japanese culture
(c) Preparation of fragments of the cells of organism for biochemical examination
(d) None of the above

76. Which of the following is true about the Bats?
1. Bats are mammals.
2. Bats have wings which are actually the modified forelimbs.
3. Bats are nocturnal in habit.

(a) 1 & 3 **(b)** 2 & 3
(c) 1, 2 & 3 **(d)** 1 & 2

77. Consider the Food Pyramid given below showing the interdependence of plants and animals in the food chain



Food Pyramid

Which one of the following in the pyramid is most delicately balanced in the chain?
(a) Top Carnivore **(b)** Plant
(c) Herbivore **(d)** Small Carnivore

78. The sequencing of the entire genome (the totality of all genes) of an organism was completed in 1996. The organism was
(a) Human being **(b)** Yeast
(c) Albino mouse **(d)** Plasmodium vivax

79. A biogas plant works to its maximum capacity when
(a) Conditions are aerobic and sewage is supplied.
(b) Conditions are anaerobic and temperature 40ºC
(c) Conditions are aerobic and temperature 40ºC
(d) Conditions are anaerobic and sewage is supplied

80. Fat present below the skin surface in our body, acts as a barrier against
(a) Loss of salts from the body
(b) Loss of essential body fluids
(c) Loss of heat from the body
(d) Entry of harmful micro-organisms from the environment

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