



Aakash

Medical | IIT-JEE | Foundations

(Divisions of Aakash Educational Services Limited)

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Time : 120 Minutes

Questions & Answers

Marks : 240

for

NATIONAL STANDARD EXAMINATION IN JUNIOR SCIENCE (NSEJS) 2019-20

Instructions to Candidates — Read carefully and strictly follow each of them

1. Question paper code is given on top right corner of each page of question paper. It must be mentioned in YOUR OMR sheet (in the space provided). Otherwise your answer sheet (OMR sheet) will NOT be assessed.
2. Use and carrying calculators of any type is strictly prohibited.
3. Use and even carrying smart watches, phones, i-pads or any other communication devices or any other objectionable material in examination centre is strictly prohibited.
4. On the answer sheet, make all the entries correctly, carefully in the space(s) provided, in capital letters as well as by properly darkening the appropriate bubbles using blue or black ball point pen only. Incomplete/ incorrect/ carelessly filled information may disqualify your candidature. Please take care while entering.
5. Please do not make any mark other than filling the appropriate bubbles properly in the space provided on the answer sheet. Further, do not write on the back side of the answer sheet.
6. As answer sheets are evaluated using machine, change of entry is not allowed. Even scratching or overwriting may result in a wrong score.
7. Question paper has 80 multiple choice questions. Each question has four alternatives, out of which only one is correct. Choose the correct alternative and fill the appropriate bubble, as shown:

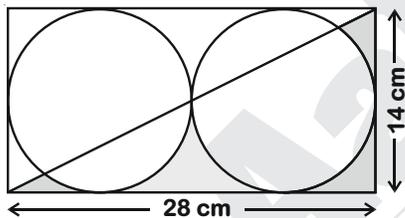
Q. (a) ● (c) (d)
8. Correct answer carries 3 marks, wrong answer –1 mark (negative 1), no attempt – zero marks.
9. Rough work should be done in the space provided in the question paper only.
10. Candidates are not permitted to leave the examination hall before the completion of the examination schedule (i.e. before 12:00 hrs).
11. Your answer sheet consists of two pages original copy and candidate's copy. Do not detach them till the end of the examination. At the end of examination, submit your answer paper (original copy) to the invigilator and take away the student's copy for your further reference.

ONLY ONE OUT OF FOUR OPTIONS IS CORRECT

1. Apples dropping from apple trees were observed by many people before Newton. But why they fall, was explained by Isaac Newton postulating the law of universal gravitation. Which of the following statements best describes the situation?
- The force of gravity acts only on the apple
 - The apple is attracted towards the surface of the earth
 - Both earth and apple experience the same force of attraction towards each other
 - Apple falls due to earth's gravity and hence only (a) is true and (c) is absurd

Answer (c)

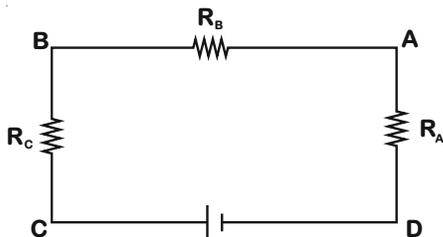
2. A rectangular metal plate, shown in the adjacent figure has a charge of $420 \mu\text{C}$ assumed to be uniformly distributed over it. Then how much is the charge over the shaded area? No part of metal plate is cut. (Circles and the diagonal are shown for clarity only. $\pi = 22/7$)



- $45 \mu\text{C}$
- $450 \mu\text{C}$
- $15 \mu\text{C}$
- $150 \mu\text{C}$

Answer (a)

3. In the adjacent circuit, the voltages across AD, BD and CD are 2 V, 6 V and 8 V respectively. If resistance $R_A = 1 \text{ k}\Omega$, then the values of resistances R_B and R_C are _____ and _____ respectively.



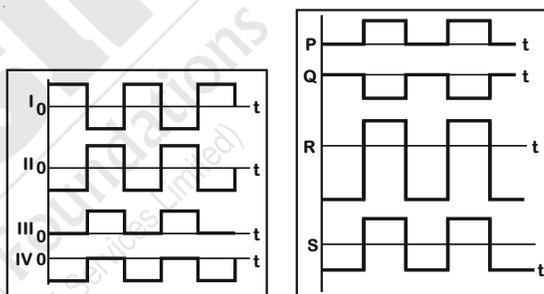
- $4 \text{ k}\Omega$ and $6 \text{ k}\Omega$
- $2 \text{ k}\Omega$ and $1 \text{ k}\Omega$
- $1 \text{ k}\Omega$ and $2 \text{ k}\Omega$
- Data insufficient as battery voltages is not given

Answer (b)

4. A new linear scale of temperature measurement is to be designed. It is called a 'Z scale' on which the freezing and boiling points of water are 20 Z and 220 Z respectively. What will be the temperature shown on the 'Z scale' corresponding to a temperature of 20°C on the Celsius scale?
- 10 Z
 - 20 Z
 - 40 Z
 - 60 Z

Answer (d)

5. Some waveforms among I, II, III and IV superpose (add graphically) to produce the waveforms P, Q, R and S. Among the following, match the pairs that give the correct combinations:



Resultant

- P
- Q
- R
- S

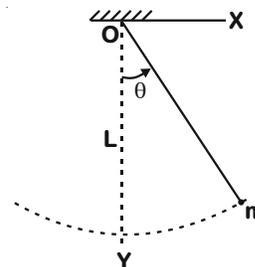
Superposition of

- (K) III and IV
- (L) II and IV
- (M) I, II and III
- (N) I and IV
- (O) II and III

- $P \leftrightarrow O, Q \leftrightarrow N, R \leftrightarrow L, S \leftrightarrow M$
- $P \leftrightarrow M, Q \leftrightarrow N, R \leftrightarrow L, S \leftrightarrow K$
- $P \leftrightarrow M, Q \leftrightarrow N, R \leftrightarrow K, S \leftrightarrow L$
- $P \leftrightarrow O, Q \leftrightarrow M, R \leftrightarrow L, S \leftrightarrow K$

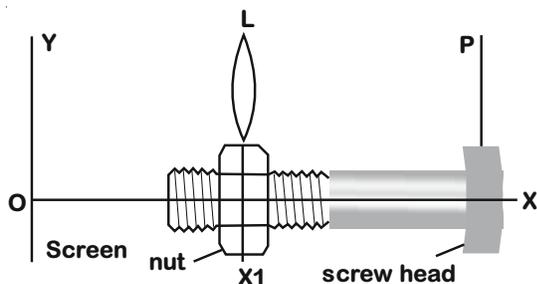
Answer (b)

6. A rigid body of mass m is suspended from point O using an inextensible string of length L . When it is displaced through an angle θ , what is the change in the potential energy of the mass? (Refer adjacent figure.)



- $mgL(1 - \cos\theta)$
- $mgL(\cos\theta - 1)$
- $mgL\cos\theta$
- $mgL(1 - \sin\theta)$

Answer (a)



- (a) 8
- (b) 10
- (c) 12
- (d) 14

Answer (b)

13. The triangular face of a crown glass prism ABC is isosceles. Length AB = length AC and the rectangular face with edge AC is silvered. A ray of light is incident normally on rectangular face with edge AB. It undergoes reflections at AC and AB internally and it emerges normally through the rectangular base with edge BC. Then angle BAC of the prism is _____.

- (a) 24°
- (b) 30°
- (c) 36°
- (d) 42°

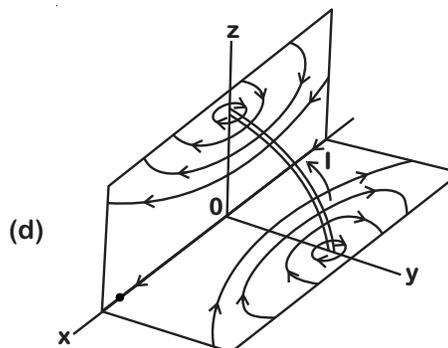
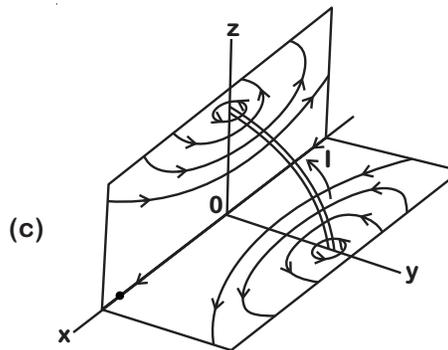
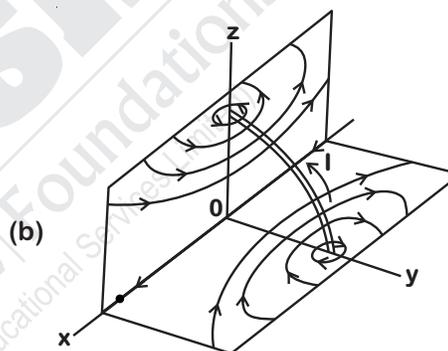
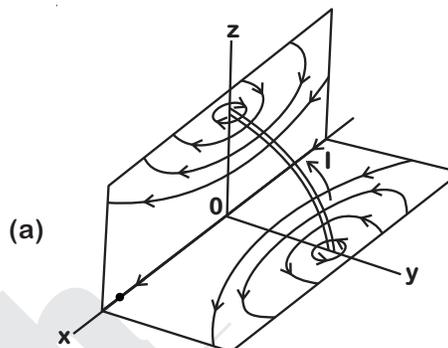
Answer (c)

14. A Physics teacher and his family are travelling in a car on a highway during a severe lightning storm. Choose the correct option:

- (a) Safest place will be inside the car as the charges due to lightning tend to remain on the metal sheet / skin of the vehicle if struck by lightning.
- (b) It's too dangerous to be inside the car. As the car has a metal body the charges tend to accumulate on the surface and will generate a strong electric field inside the car.
- (c) Safest place is under a tree. It's better to get drenched under a tree as the wet tree will provide a path to the charges for earthing.
- (d) It is safer to exit the car and stand on open ground

Answer (a)

15. A conductor in the form of a circular loop is carrying current I . The direction of the current is as shown. Then which figure represents the correct direction of magnetic field lines on the surfaces of the planes XY and XZ. (Consider those surfaces of the XY and XZ planes which are seen in the figure.)



Answer (a)

16. A school is located between two cliffs. When the metal bell is struck by school attendant, first echo is heard by him after 2.4 s and second echo follows after 2.0 s for him at the same position near the bell. If the velocity of sound in air is 340 ms^{-1} at the temperature of the surroundings, then the distance between the cliffs is approximately ____.
- (a) 0.488 km (b) 0.751 km
 (c) 1.16 km (d) 1.41 km

Answer (c)

17. The radius of curvature of a convex mirror is 'x'. The distance of an object from focus of this mirror is 'y'. Then what is the distance of image from the focus?

- (a) $\frac{y^2}{4x}$ (b) $\frac{x^2}{y}$
 (c) $\frac{x^2}{4y}$ (d) $\frac{4y^2}{x}$

Answer (c)

18. A piece of ice is floating in water at 4°C in a beaker. When the ice melts completely, the water level in the beaker will
- (a) Rise
 (b) Fall
 (c) Remains unchanged
 (d) Unpredictable

Answer (a)

19. A particle experiences constant acceleration for 20 s after starting from rest. If it travels a distance S_1 in the first 10 s and distance S_2 in the next 10 s, the relation between S_1 and S_2 is:
- (a) $S_2 = 3S_1$ (b) $S_1 = 3S_2$
 (c) $S_2 = 2S_1$ (d) $S_1 = 10S_2$

Answer (a)

20. A sound wave is produced by a vibrating metallic string stretched between its ends. Four statements are given below. Some of them are correct.
- (P) Sound wave is produced inside the string
 (Q) Sound wave in the string is transverse
 (R) Wavelength of the sound wave in surrounding air is equal to the wavelength of the transverse wave on the string
 (S) Loudness of sound is proportional to the square of the amplitude of the vibrating string

Choose the correct option.

- (a) P (b) R and S
 (c) P and Q (d) S

Answer (d)

21. How many positive integers N give a remainder 8 when 2008 is divided by N?
- (a) 12 (b) 13
 (c) 14 (d) 15

Answer (d)

22. What is the product of all the roots of the equation $\sqrt{5|x|+8} = \sqrt{x^2-16}$?
- (a) -64 (b) -24
 (c) 576 (d) 24

Answer (a)

23. LCM of two numbers is 5775. Which of the following cannot be their HCF?
- (a) 175
 (b) 231
 (c) 385
 (d) 455

Answer (d)

24. Let α and β be the roots of $x^2 - 5x + 3 = 0$ with $\alpha > \beta$. If $a_n = \alpha^n - \beta^n$ for $n \geq 1$ then the value of $\frac{3a_6 + a_8}{a_7}$ is
- (a) 2 (b) 3
 (c) 4 (d) 5

Answer (d)

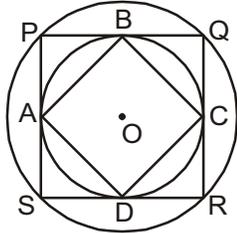
25. The number of triples (x, y, z) such that any one of these numbers is added to the product of the other two, the result is 2, is
- (a) 1 (b) 2
 (c) 4 (d) Infinitely many

Answer (b)

26. In rectangle ABCD, AB = 5 and BC = 3. Points F and G are on the line segment CD so that DF = 1 and GC = 2. Lines AF and BG intersect at E. What is the area of AEB?
- (a) 10 sq. units
 (b) $15/2$ sq. units
 (c) $25/2$ sq. units
 (d) 20 sq. units

Answer (c)

27. In the given figure, two concentric circles are shown with centre O. PQRS is a square inscribed in the outer circle. It also circumscribes the inner circle, touching it at points B, C, D and A. What is the ratio of the perimeter of the outer circle to that of quadrilateral ABCD?



- (a) $\frac{\pi}{4}$ (b) $\frac{3\pi}{2}$
(c) $\frac{\pi}{2}$ (d) π

Answer (c)

28. If a, b, c are distinct real numbers such that $a + \frac{1}{b} = b + \frac{1}{c} = c + \frac{1}{a}$ evaluate abc.

- (a) $\pm\sqrt{2}$ (b) $\sqrt{2}-1$
(c) $\sqrt{3}$ (d) ± 1

Answer (d)

29. If the equation $(\alpha^2 - 5\alpha + 6)x^2 + (\alpha^2 - 3\alpha + 2)x + (\alpha^2 - 4) = 0$ has more than two roots, then the value of α is

- (a) 2
(b) 3
(c) 1
(d) None of these

Answer (a)

30. Mr. X with his eight children of different ages is on a family trip. His oldest child, who is 9 years old saw a license plate with a 4-digit number in which each of two digits appear two times. "Look daddy!" she exclaims. "That number is evenly divisible by the age of each of us kids!". "That's right," replies Mr. X, "and the last two digits just happen to be my age". Which of the following is not the age of one of Mr. X's children?

- (a) 4 (b) 5
(c) 6 (d) 7

Answer (b)

31. How many number lie between 11 and 1111 which divided by 9 leave a remainder 6 and when divided by 21 leave a remainder 12?

- (a) 18 (b) 28
(c) 8 (d) None of these

Answer (a)

32. Two unbiased dice are rolled. What is the probability of getting a sum which is neither 7 nor 11?

- (a) $\frac{7}{9}$ (b) $\frac{7}{18}$
(c) $\frac{2}{9}$ (d) $\frac{11}{18}$

Answer (a)

33. The solution of the equation $1 + 4 + 7 + \dots + x = 925$ is

- (a) 73 (b) 76
(c) 70 (d) 74

Answer (a)

34. An observer standing at the top of a tower, finds that the angle of elevation of a red bulb on the top of a light house of height H is α . Further, he finds that the angle of depression of reflection of the bulb in the ocean is β . Therefore, the height of the tower is

- (a) $\frac{H(\tan\beta - \tan\alpha)}{(\tan\beta + \tan\alpha)}$ (b) $\frac{H\sin(\beta - \alpha)}{\cos(\alpha + \beta)}$
(c) $\frac{H(\cos\alpha - \cos\beta)}{(\cot\alpha + \cot\beta)}$ (d) H

Answer (a)

35. The sum of the roots of $\frac{1}{x+a} + \frac{1}{x+b} = \frac{1}{c}$ is zero. The product of roots is

- (a) 0 (b) $\frac{a+b}{2}$
(c) $-\frac{1}{2}(a^2 + b^2)$ (d) $2(a^2 + b^2)$

Answer (c)

36. In the convex quadrilateral ABCD, the diagonals AC and BD meet at O and the measure of angle AOB is 30° . If the areas of triangle AOB, BOC, COD and AOD are 1, 2, 8 and 4 square units respectively, what is the product of the lengths of the diagonals AC and DB in sq. units?

- (a) 60 (b) 56
(c) 54 (d) 64

Answer (a)

37. If $\tan\theta + \sec\theta = 1.5$, then value of $\sin\theta$ is

- (a) $\frac{5}{13}$
 (b) $\frac{12}{13}$
 (c) $\frac{3}{5}$
 (d) $\frac{2}{3}$

Answer (a)

38. If $\sin^2x + \sin^2y + \sin^2z = 0$, then which of the following is NOT a possible value of $\cos x + \cos y + \cos z$?

- (a) 3 (b) -3
 (c) -1 (d) -2

Answer (d)

39. Find the remainder when x^{51} is divided by $x^2 - 3x + 2$.

- (a) x (b) $(2^{51} - 2)x + 2 - 2^{51}$
 (c) $(2^{51} - 1)x + 2 - 2^{51}$ (d) 0

Answer (c)

40. In an equilateral triangle, three coins of radii 1 unit each are kept so that they touch each other and also sides of the triangle. The area of triangle ABC (in sq. units) is

- (a) $4 + 2\sqrt{3}$ (b) $4\sqrt{3} + 6$
 (c) $12 + \frac{7\sqrt{3}}{4}$ (d) $3 + \frac{7\sqrt{3}}{4}$

Answer (b)

41. In case of mice coat colour, two genes are responsible for colour of the hair. Gene 'A' is responsible for distribution of pigments on shaft of hair. Wild type allele of 'A' produces a yellow band on dark hair shaft (agouti), whereas recessive allele produces no yellow band. There is another allele of A, known as A^Y , which is embryonic lethal in homozygous condition only. In an experiment, two yellow mice were crossed to obtain a progeny of 6 pups. What would be the most probable number of agouti mice among them?

- (a) 0 (b) 2
 (c) 4 (d) None of the above

Answer (b)

42. A stain was developed by a group of scientists to stain a particular cell organelle. The stain was tested on various tissues derived from an autopsy sample from a mammal. The organelles were counted. The results showed maximum number of the organelles in cells of brain, lesser in cells of heart, least in mature sperms and absent in erythrocytes. Identify the organelles from following options.

- (a) Nissl bodies
 (b) Mitochondria
 (c) Golgi bodies
 (d) Endoplasmic reticulum

Answer (a)

43. *Pinus sylvestris* grows at low temperatures in Russia. The plant survives under such freezing conditions due to the presence of :

- (a) Saturated lipids in plasma membrane
 (b) Glycoproteins in plasma membrane
 (c) Glycolipids in plasma membrane
 (d) Polyunsaturated lipids in plasma membrane

Answer (d)

44. In an experimental setup, certain pathogen caused a disease in primates with nasal congestion, sore throat and fever being the common symptoms. The scientists injected an extract from blue-green mold as the first line of action. However, the symptoms did not subside. The possible causative agents of the disease were listed out as follows.

- A virus
- A fungus
- A conjugation deficient bacterium
- A tapeworm

Choose the correct option from the following that indicate the pathogen.

- (a) i, ii
 (b) i, iii
 (c) ii, iv
 (d) iii only

Answer (b)

45. A group of students was studying development of an organism under controlled laboratory conditions. Following observations were made by them.

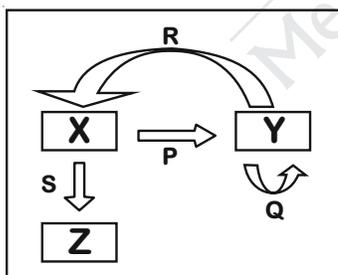
- i. The larvae had a rod-like supporting structure that separated the nervous system and the gut.
- ii. A prominent central cavity was present in the transverse section of the part of the nervous system of the larvae; while the adults had cerebral ganglia as the main component of the nervous system.
- iii. The eyes were prominently seen in larvae.
- iv. The tails were absent in the adults, which the larvae had.
- v. A lot of phagocytic activity was observed before conversion of larvae into adults.
- vi. The adults had a cuticular exoskeleton.

The organism under study must be belonging to :

- (a) Amphibia (b) Pisces
(c) Protochordata (d) Arthropoda

Answer (c)

46. A process is represented in the adjacent figure. The arrows indicate the flow of a biochemical reaction. The arrowhead points to the product, while the base of the arrow indicates the template biomolecule. What do P, Q, R, and S represent?



- (a) P : Replication, Q : Translation, R : Transcription, S : Reverse Transcription
(b) P : Transcription, Q : Replication, R : Reverse Transcription, S : Translation
(c) P : Reverse Transcription, Q : Replication, R : Translation, S : Transcription
(d) P : Reverse Transcription, Q : Replication, R : Transcription, S : Translation

Answer (d)

47. The whooping cranes were on the verge of extinction with only 21 individuals in wild in 1941. After conservation measures, the cranes are now included in the endangered category by IUCN. The highlight of the conservation efforts is the reintroduction of the whooping cranes in wild. This was possible due to raising of the young cranes in absence of their parents by biologists dressed in crane costumes. Aircraft Guided bird migration technique was used for teaching the captive-bred cranes to follow the scientists to learn the migratory route. What type of animal behaviour might be responsible for these captive-bred cranes to follow the crane costume dressed scientists?

- (a) Cognitive learning
(b) Habituation
(c) Operant conditioning
(d) Genetic Imprinting

Answer (d)

48. In the baking industry, when the dough is prepared, various ingredients are mixed together with the flour. At one instance, the dough was fermented, but failed to rise sufficiently during the baking process. Choose the correct cause(s) from following possibilities.

- i. The salt was mixed before the fermentation process was completed
 - ii. The sugar was added in excess
 - iii. Yeast granules were not activated prior to mixing with the flour.
- (a) i, iii (b) iii only
(c) i, ii, iii (d) i, ii

Answer (c)

49. Given below are four statements.

- I. Prokaryotic cells are unicellular while eukaryotes are multicellular.
- II. Histones are present in eukaryotes and absent in prokaryotes.
- III. The nucleoid contains the genetic material in prokaryotes and eukaryotes.
- IV. Prokaryotic flagellum is composed of flagellin while eukaryotic flagellum is composed of tubulin.

Identify which amongst these are false.

- (a) I and II (b) III and IV
(c) II and III (d) I and III

Answer (d)

50. The students of a college were working on regeneration using *Planaria* (Platyhelminthes) and *Asterias* (Echinodermata). *Planaria* was cut in three pieces, namely, a piece with head, with tail and the middle piece. *Asterias* (bearing five arms) was cut in such a way that after separation, six pieces were obtained, namely, an arm with a portion of the central disc, four pieces cut from tips of each of the remaining arms and the remaining body. The animals were allowed to regenerate completely. How many *Planaria* and *Asterias* respectively will be obtained after the completion of regeneration in both?

- (a) 1, 1
- (b) 3, 2
- (c) 3, 6
- (d) 1, 2

Answer (b)

51. Fecundity in animal world is the maximum possible ability of an individual to produce offsprings during its entire lifetime. Following factors were checked for their effect on fecundity of different animal models.

- i. Availability of food during breeding season
- ii. Mode of fertilization
- iii. Population density

Which of these factor(s) can regulate fecundity?

- (a) i, ii
- (b) ii, iii
- (c) i, ii, iii
- (d) None of the above

Answer (c)

52. An organism has 27 pairs of homologous chromosomes. In each daughter cell after completion of mitosis and in each gamete after completion of meiosis II, _____ and _____ chromosomes would be present respectively.

- (a) 27 and 27
- (b) 54 and 27
- (c) 108 and 54
- (d) 54 and 108

Answer (b)

53. Rahul sprayed a chemical 'X' on a plant with rosette habit. After few days, he found the internodal distances to have increased suddenly. The chemical 'X' might be:

- (a) Ethylene
- (b) Abscisic acid
- (c) Auxin
- (d) Gibberellic acid

Answer (d)

54. In case of peppered moths, pale and dark moths are observed. Pale variety is known to be the wild type variety. During industrial revolution, industrial melanism led to prevalence of dark variety around the cities and pale variety continued to be in majority in areas away from the industries. After enforcement of regulations for controlling pollution, reappearance of pale moths in majority was observed around cities again. Driving force(s) for these adaptive changes is/are:

- i. Increased pollution around industries
- ii. A stable transposition of a gene in moths
- iii. Limitations of the vision of birds to differentiate dark moths on darkened barks and pale moths in presence of lichens
- iv. Ability of lichens to grow on barks in less polluted areas only.

- (a) i, iv
- (b) i, iii, iv
- (c) i, ii
- (d) i, ii, iii and iv

Answer (b)

55. A 4 μm long bacterial cell was magnified and drawn to a dimension of 6 cm. How many times has it been magnified?

- (a) 1.5×10^3
- (b) 15×10^4
- (c) 1.5×10^4
- (d) 1.5

Answer (c)

56. Gymnosperms are called 'naked seed bearing plants' because they lack:

- (a) Male gamete
- (b) Ovule
- (c) Ovary
- (d) Seeds

Answer (c)

57. Any damage or injury to a particular area causes nociceptors to release some chemicals, which carry the signal to the higher centres in the nervous system for the processing and a subsequent action. However, there is a difference in the way in which the stimulus is received which is related to the acuity of the detection. Fingertips are more sensitive as compared to the forearm. Following reasons for the observed phenomenon were suggested.

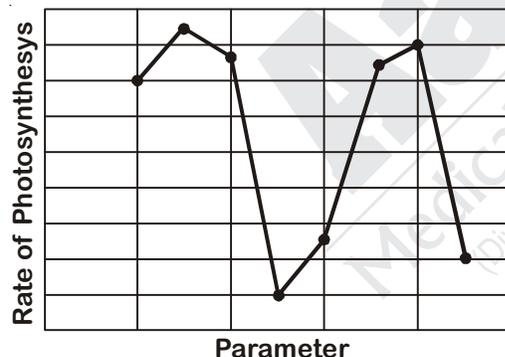
- The receptive fields in the fingertip are smaller
- The number of nociceptors per receptive field in the forearm is lesser
- The amount of prostaglandins released by the nociceptors per receptive field is more in fingertips

The most probable reason(s) for this may be:

- i
- i, iii
- ii, iii
- i, ii, iii

Answer (d)

58.



Rate of photosynthesis in hydrophytes depends on various parameters. The adjacent graph shows the effect of one parameter (while keeping all the others constant) on the rate of photosynthesis. Rate of photosynthesis is plotted on Y axis. Identify the parameter which is plotted along X axis:

- Light intensity
- Wavelength
- Temperature
- CO₂ concentration

Answer (b)

59. On a study tour, plants with leathery leaves with thick cuticle, vivipary, salt glands, apogeotropic roots and stomata limited to abaxial surface were observed. The plants might be:

- Bromeliads
- Cycads
- Mangroves
- None of the above

Answer (c)

60. Four different human body fluid samples were subjected to quantification of hydrogen ion concentration. mEq/L is the unit of measurement for hydrogen ion concentration. The results of the experiment were as follows:

Sample A: 1.6×10^2 units

Sample B: 4.5×10^{-5} units

Sample C: 1×10^{-3} units

Sample D: 3×10^{-2} units

Identify the samples in sequence from A to D.

- Gastric HCl, Venous blood, Intracellular Fluid, Urine
- Venous blood, Intracellular Fluid, Gastric HCl, Urine
- Urine, Gastric HCl, Venous blood, Intracellular Fluid
- Intracellular Fluid, Urine, Gastric HCl, Venous blood

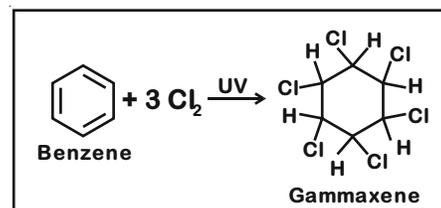
Answer (a)

61. Four gram of mixture of calcium carbonate and sand is treated with excess of HCl and 0.880 g of carbon-di-oxide is produced. What is the percentage of calcium carbonate in original mixture?

- 40%
- 50%
- 55%
- 45%

Answer (b)

62.



Gammaxene insecticide powder is prepared by the reaction given in the adjacent box. If 78 g of benzene when reacted with 106.5 g of chlorine, how much Gammaxene would be formed?

- 140 g
- 154.5 g
- 145.5 g
- 160 g

Answer (c)

63. Which of the following polymeric material will be ideal for remoulding?
- (a) Polythene and Melamine
 (b) Polyvinyl chloride and Polythene
 (c) Melamine and Bakelite
 (d) Bakelite and Polyvinyl chloride

Answer (b)

64. An element Y is a white translucent solid at room temperature and exhibits various allotropic forms. Some compounds of element Y find application in agricultural industry. Y forms two solid oxides which dissolve in water to form comparatively weak acids. The element Y is:
- (a) Sulphur (b) Nitrogen
 (c) Phosphorous (d) Carbon

Answer (c)

65. How many sigma bonds are present between any two carbon atoms in fullerenes?
- (a) 1 (b) 2
 (c) 3 (d) 4

Answer (a)

66. A student was studying reactions of metals with dilute NaOH at room temperature. The student took dilute NaOH in four different test tubes and added copper powder to test tube A, zinc dust to test tube B, aluminium powder to test tube C and iron powder to test tube D and observed effervescence in _____.
- (a) Test tubes A & B
 (b) Test tubes B & C
 (c) Test tubes C & D
 (d) Test tubes A & D

Answer (b)

67. A magician performed following act: He dipped Rs. 50 note in a 50% solution of alcohol in water and held it on the burning flame, but the note did not burn. The reason behind this is
- (a) The alcohol kept on dousing the fire
 (b) Air required for burning was not available
 (c) The Rs. 50 note failed to reach ignition temperature
 (d) The Rs. 50 note is fire proof

Answer (c)

68. Substance X is white crystalline solid which melts after 10 seconds on burner flame. It is soluble in water and insoluble in CCl_4 . It is a poor conductor of electricity in molten state as well as in the form of aqueous solution, hence we conclude that substance X is
- (a) An ionic compound
 (b) A non-polar covalent compound
 (c) A polar covalent compound
 (d) A pure element

Answer (c)

69. In a beaker 50 ml of a normal HCl solution was taken and NH_3 gas was passed through it for some time. The contents of the beaker were then titrated, which required 60 ml of semi normal NaOH solution. How much ammonia was passed through the beaker?
- (a) 0.85 g (b) 0.34 g
 (c) 0.51 g (d) 0.4 g

Answer (b)

70. Which is the correct order of metals with reference to their melting point in increasing order?
- (a) Hg, Ga, Li, Ca
 (b) Ca, Li, Ga, Hg
 (c) Hg, Li, Ga, Ca
 (d) Hg, Ga, Ca, Li

Answer (a)

71. Which of the following is iso-structural with CO_2 ?
- (a) NO_2 (b) N_2O_4
 (c) NO (d) N_2O

Answer (d)

72. Sodium tungstate has formula Na_2WO_4 , lead phosphate has formula $\text{Pb}_3(\text{PO}_4)_2$, formula for lead tungstate should be:
- (a) PbWO_4 (b) $\text{Pb}_2(\text{WO}_4)_3$
 (c) $\text{Pb}_3(\text{WO}_4)_2$ (d) $\text{Pb}_3(\text{WO}_4)_4$

Answer (a)

73. What is the ratio of reducing agent to oxidizing agent, if the following reaction is correctly balanced? $\text{NH}_3 + \text{O}_2 \rightarrow \text{NO} + \text{H}_2\text{O}$
- (a) 4 : 5 (b) 5 : 4
 (c) 5 : 3 (d) 3 : 5

Answer (a)

74. Arrange following solutions in increasing hydronium ion concentration. The solutions are:

(P) 0.1 M HCl (Q) 0.1 M H_2SO_4 (R) 0.001 M NH_4OH (S) 0.001 M $Ca(OH)_2$

The correct order will be

- (a) $P > Q > R > S$ (b) $Q > P > S > R$
 (c) $S > R > Q > P$ (d) $S > R > P > Q$

Answer (*) None of the given option is correct

75. A zinc rod was dipped in 100 cm³ of 1M copper chloride solution. After certain time the molarity of Cu^{2+} ions in the solution was found to be 0.8 M. If the weight of zinc rod is 20 g, then the molarity of chloride ions is _____.

- (a) 2 M
 (b) 1.5 M
 (c) 1 M
 (d) 0.5 M

Answer (a)

76. When four dilute solutions of (I) vinegar, (II) common salt, (III) caustic soda and (IV) baking soda are tested with universal indicator which will be the correct observation

- (a) I - Green, II - Violet, III - Blue, IV - Red
 (b) I - Green, II - Blue, III - Violet, IV - Red
 (c) I - Red, II - Green, III - Violet, IV - Blue
 (d) I - Red, II - Violet, III - Green, IV - Blue

Answer (c)

77. In one litre of pure water, 44.4 g of calcium chloride is dissolved. The number of ions in one mL of the resultant solution is:

- (a) 7.23×10^{23} (b) 7.23×10^{20}
 (c) 4.82×10^{23} (d) 4.82×10^{20}

Answer (b)

78. Which of the following species is/are isoelectronic with Neon?

- (i) N^{3-} (ii) Mg^{2+}
 (iii) K^+ (iv) Ca^{2+}
 (a) Only (iv) (b) Only (ii)
 (c) Both (i) & (ii) (d) Both (i) & (iii)

Answer (c)

79. Which of the following gases will have equal volume at STP, if the weight of gases is 14.0 g?

- (i) N_2O (ii) NO_2
 (iii) N_2 (iv) CO
 (a) (i) & (ii) (b) (ii) & (iii)
 (c) (i) & (iii) (d) (iii) & (iv)

Answer (d)

80. Which of the following are not ionic?

- (i) $AlCl_3$ (ii) $CaCl_2$
 (iii) $MgCl_2$ (iv) $LiCl$
 (a) (i) & (iv) (b) (i) & (ii)
 (c) (ii) & (iii) (d) (iii) & (iv)

Answer (a)

