



ALL KERALA BHAVAN'S SCHOLARSHIP EXAMINATION NOVEMBER 2023

Class: XII (Science-Maths)
Date: 28.11.2023

Marks: 100
Time: 1½ hrs

GENERAL INSTRUCTIONS:

Read the instructions carefully before answering

1. Please fill up your Roll No. and class in the box provided on the OMR sheet.
2. This question booklet contains 50 questions and 5 Tie Breaker questions. All questions including 'Tie Breaker Questions' are mandatory. Tie Breaker questions will be evaluated only in case of a Tie.
3. Each question carries 2 marks.
4. Each question has 4 answer choices a,b,c,d.
5. For each question, select the best/correct option and darken the bubble completely against the corresponding question in the OMR sheet provided.
6. Use a blue/black ball point pen to darken the bubble.
7. Darken only one bubble against each question.
8. There will be no negative marking.

Choose the correct answer from the options given.

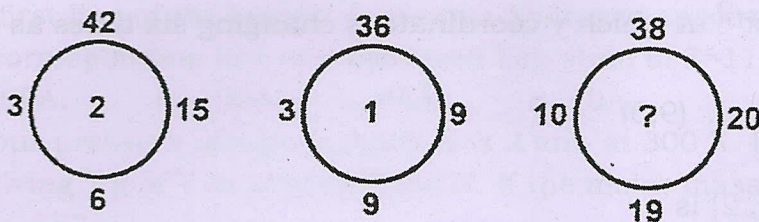
1. "The pen is mightier than the sword" is an example of _____
a. pun b. metonymy c. oxymoron d. alliteration
2. Choose the correctly spelt word.
a. manoeuvre b. manoeuvre c. manoeuver d. maneuver
3. Choose the correct meaning of the underlined idiom in the sentence:
'After doing a lot of hard work the whole day, Harry hit the sack.'
a. Found the treasure b. Went to sleep
c. Won the jackpot d. Hit on the sack
4. Which literary device is used in the sentence: "The world is my oyster"?
a. Simile b. Metaphor c. Hyperbole d. Onomatopoeia
5. Identify one word for the following
One who is indifferent to culture or arts.
a. Primitive b. Illiterate c. Philistine d. Barbarian
6. Choose the synonym of 'belligerent'.
a. benign b. argumentative c. amicable d. friendly
7. Choose the correct option and complete the sentence.
How long have you known each other?
We've known each other since we _____ at school.
a. have been b. are c. were d. had been
8. Which one of the following options maintain a logical relation in the statement given.
Nostalgia is to anticipation as _____ is to _____.
a. future, present b. past, future
c. present, future d. past, present
9. The astronomical telescope consists of objective and eyepiece. The focal length of the objective is
a. equal to that of the eyepiece b. shorter than that of the eyepiece
c. greater than that of the eyepiece d. five times shorter than that of eyepiece

10. The supply voltage to a room is 120 V. The resistance of the lead wires is 6Ω . A 60W bulb is already switched on. What is the decrease of voltage across the bulb, when a 240 W heater is switched on in parallel to the bulb?
 a. zero volt b. 2.9 volt c. 13.3 volt d. 10.04 volt
11. In a series LCR circuit, resonance frequency depends on
 a. $\frac{L}{C}$ b. \sqrt{LC} c. $\frac{1}{\sqrt{LC}}$ d. $\sqrt{\frac{L}{C}}$
12. Light traveling from a transparent medium to air undergoes total internal reflection at an angle of incidence of 45° . Then refractive index of the medium may be
 a. 1.5 b. 1.3 c. 1.1 d. $\frac{1}{\sqrt{2}}$
13. 4eV is the energy of the incident photon and the work function is 2 eV. The stopping potential will be
 a. 2 V b. 4 V c. 6 V d. $2\sqrt{2}$ V
14. A sensitive magnetic instrument can be shielded very effectively from outside magnetic fields by placing it inside a box of:
 a. Teak wood. b. Plastic material
 c. Soft iron of high permeability. d. A metal of high conductivity
15. Young's double slit experiment is performed with blue light (wavelength = 460 nm) and green light (wavelength = 550 nm) respectively. If 'Y' is the distance of 4th maximum from the central fringe, then
 a. $Y_B = Y_G$ b. $Y_B > Y_G$ c. $Y_G > Y_B$ d. $Y_B/Y_G = 550/460$
16. The drift velocity of free electrons in a conductor is 'v', when a current 'I' is flowing in it. If, the radius of the conductor and the current through it is doubled, then drift velocity will be
 a. $v/4$ b. $v/2$ c. $2v$ d. $4v$
17. The first line of the Lyman series in a hydrogen spectrum has a wavelength of 1210 Å. The corresponding line of a hydrogen like atom of $Z=11$ is equal to:
 a. 4000Å. b. 100Å. c. 40Å. d. 10Å.
18. Vapour pressure of a pure liquid X is 2 atm at 300 K. It is lowered to 1 atm on dissolving 1 g of Y in 20 g of liquid X. If the molar mass of X is 200, what is the molar mass of Y?
 a. 20 b. 50 c. 100 d. 200
19. Chromate ion (yellow) changes to dichromate ion (orange) in $\text{pH} = x$ and vice versa in $\text{pH} = y$. Identify x and y
 a. 6 and 8 b. 6 and 5 c. 8 and 6 d. 5 and 6
20. Consider the reaction

$$\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{NaCN} \longrightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{CN} + \text{NaBr}$$
 The reaction will be fastest in
 a. Ethanol b. Methanol c. Acetone d. Water
21. The ketone $\text{C}_6\text{H}_5\text{COCH}_3$ will **not** be formed by
 a. reaction of benzene and acetyl chloride in the presence of AlCl_3
 b. reaction of acetonitrile with phenylmagnesium bromide in ether followed by hydrolysis
 c. treatment of propylchloride with dibenzyl cadmium.
 d. addition of water to phenylacetylene in the presence of mercuric sulphate and dil H_2SO_4

22. When phenol reacts with bromine water, what is the result?
 a. Brown Liquid b. Colourless Gas c. White Precipitate d. Purple Colouration
23. Which of the following reagents cannot, be used to oxidise primary alcohols to aldehydes?
 a. CrO_3 in anhydrous medium b. KMnO_4 in acidic medium
 c. Pyridinium chlorochromate d. Heat in the presence of Cu at 573K
24. When the concentration of a reactant in reaction $A \rightarrow B$ is increased by 8 times but rate increases only 2 times, the order of the reaction would be:
 a. 2 b. $1/3$ c. 4 d. $1/2$
25. Which of the following statements regarding the complex $[\text{M}(\text{AA})_2\text{A}_2]$ is correct?
 a. cis-form is optically active while trans-form is inactive
 b. cis-form is optically inactive while trans-form is active
 c. Both cis-and trans-forms are optically active
 d. Both cis-and trans-forms are optically inactive
26. The alkyl halide is converted into an alcohol by
 a. Addition b. Substitution c. Dehydrohalogenation d. Elimination
27. The value of $\tan^{-1}(\tan \frac{7\pi}{6})$ is
 a. $\frac{\pi}{6}$ b. $\frac{\pi}{2}$ c. $\frac{\pi}{3}$ d. $\frac{7\pi}{6}$
28. If $(\frac{1+x}{1-y}) = a$ then $\frac{dy}{dx}$ is equal to
 a. $\frac{x-1}{y-1}$ b. $\frac{x-1}{y+1}$ c. $\frac{y-1}{x+1}$ d. $\frac{y+1}{x-1}$
29. The degree of the differential equation $\{5 + (\frac{dy}{dx})^2\}^{5/3} = x^5 (\frac{d^2y}{dx^2})$ is
 a. 4 b. 2 c. 3 d. 10
30. The point on the curve $y = x^2$ at which y coordinate is changing six times as fast as x coordinate is
 a. (6,2) b. (2,4) c. (3,9) d. (9,3)
31. If $x^y \cdot y^x = 16$, then $\frac{dy}{dx}$ at (2, 2) is
 a. 0 b. 1 c. -1 d. 2
32. If a relation R on the set $\{1,2,3\}$ be defined by $R = \{(1, 2)\}$, then R is
 a. Reflexive b. transitive c. symmetric
 d. reflexive, symmetric and not transitive
33. The area bounded by the curves $y = \sin x$ between the ordinates $x = 0$ and $x = \pi$ and the x-axis is
 a. 4 square units b. 2square units c. 3 square units d. 1 square unit
34. $\int_0^1 \frac{\log(1+x)}{1+x^2} dx$ is
 a. $\frac{\pi}{8} \log 2$ b. $-\frac{\pi}{8} \log 2$ c. $\frac{\pi}{4} \log 2$ d. $-\frac{\pi}{4} \log 2$

35. In two different societies, there are some school going students including boys as well as girls. Reeta forms two sets with these students as her college project. Let $A = \{a, b, c, d, e\}$ and $B = \{u, v, w, x\}$, where a, b, c, d and e are school going students of first society and u, v, w and x are that of the second society respectively. Then find the number of onto functions from A to B
- a. 512 b. 480 c. 1024 d. 240
36. 'Dragonfly' the recent project of NASA, was launched to explore which planet?
a. Mars b. Jupiter c. Saturn d. Venus
37. Which Indian player has recorded the maximum number of wins in Davis Cup?
a. Mahesh Bhupathi b. Leander Paes c. Sumit Nagal d. Rohan Bopanna
38. What is the name of India's first solar roof cycling track inaugurated in Hyderabad in October 2023?
a. Eco Pedal b. Healthway c. Sun Cycle d. Solar Ride
39. 'Red Light On Gaadi Off' campaign was launched by the government of _____
a. Uttar Pradesh b. Haryana c. Delhi d. Punjab
40. The President of which Asian country launched the country's first carbon emission credit trading?
a. Malaysia b. China c. India d. Indonesia
41. Find the missing number: 195, 383, 575, 763, 955, _____ .
a. 1123 b. 1166 c. 1197 d. 1143
42. What value will replace '?' in the figure given below?



- a. 0 b. 1 c. 2 d. 3
43. What number comes next in this sequence?
26, 34, 41, 46, 56?
a. 58 b. 67 c. 80 d. 76
44. Five students P, Q, R, S and T are sitting in a row, S is on the right of T, Q is on the left of T but on the right of P. S is on the left of R. Who is sitting on the extreme right?
a. P b. Q c. R d. T
45. AEI : LQV :: ACE : H__

- a. KN b. DC c. OP d. QW

46. Nine boxes named P, Q, R, S, T, U, V, W and X are placed one above each other but not necessarily in the same order. Only five boxes are placed between P and R. T is placed immediately above R. Only three boxes are placed between T and S. As many boxes are placed between P and S as between Q and T. U is placed below Q, but not at bottom. More than four boxes are placed between T and U. One box is placed between U and V. Box X is placed above box W. If in a certain way S is related to X and P is related to W then by which among the following Q is related?

- a. P b. V c. R d. T

47. Link the following statements by choosing the correct option from the following:

STATEMENT 1: To achieve economical development, people should work hard

STATEMENT 2: Working hard is not impossible

- a. Both the statements stand independent
 b. Statement 2 can be inferred from Statement 1
 c. Statement 1 can be inferred from Statement 2
 d. Both statements are dependent

Read the statements and conclusions carefully(Qn.48-Qn.50). Assume that the information given in the statements is true and decide which of the given conclusions logically follow(s) from the statements.

48.	STATEMENTS No author is a doctor Some doctors are specialists All scientists are doctors	CONCLUSION I Some scientists are authors II No scientist is an author III Some doctors are scientists
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- a. Only conclusions II and III follow
 b. Only conclusions I and II follow
 c. Only conclusion II follows
 d. Either conclusion I Or II and III follow(s)

49. Statement: This world is neither good nor evil, each man manufactures a world for himself or herself.

Conclusions:

- i. Some people find this world quite good.
 ii. Some people find this world quite bad.

Choose the answer-

- a. Only conclusion I follows
 b. Only conclusion II follows
 c. Neither I nor II follows
 d. Both I & II follows

50. Statements

- i) Some sofas are cushions
- ii) All cushions are curtains
- iii) Only a few curtains are chairs

Conclusions

- i) All curtains are cushions
- ii) Some cushions are chairs
- iii) Some sofas are chairs
- iv) All sofas are cushions

Which of the given conclusions logically follows from the given statements?

- a. Only iv follows
- b. Only iii and iv follows
- c. All follows
- d. None follows

TIE BREAKER

51. Fill in the blank with the correct word.

Modern youth is fond of _____ life.

- a. ostentatious
- b. ostentation
- c. ostentious
- d. ostensibly

52. A constant current is flowing through a solenoid. An iron rod is inserted in the solenoid along its axis. Which of the following quantities will not increase?

- a. The magnetic field at the centre
- b. The rate of heating
- c. The magnetic flux linked with the solenoid
- d. The self-inductance of the solenoid

53. The halide which undergoes nucleophilic substitution most readily is

- a. p-H3CC6H4Cl
- b. o-H3COC6H4Cl
- c. p-ClC6H4Cl
- d. p-NO2C6H4Cl

54. If $A = [ab \ b^2 - a^2 \ -ab]$ and $A^n = \mathbf{0}$, then the minimum value of n is

- a. 1
- b. 2
- c. 3
- d. 4

55. Waheeda Rahman won this year's Dadasaheb Phalke Award. Who was its first recipient?

- a. Nargis Dutt
- b. Lata Mangeshkar
- c. Devika Rani
- d. Sivaji Ganesan