



DR. A. QADEER SCHOLARSHIP EXAM

GSI SHAHEEN DHANBAD
(Global School Of India Campus)

SESSION 2026-27



Date: _____

Total Marks: 400

Class XII Science - English Medium

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

Important Instructions:

1. **The Answer Sheet is inside this Test Booklet**, take out the Answer Sheet and fill in the particulars carefully with blue/black ball point pen only.
2. The test is of 2 hour's duration and the Test Booklet contains 100 multiple-choice questions (four options with a single correct answer) from (Physics-20) (Chemistry-20) (Mathematics-20) (Biology-20) (Mental Ability-20) Candidates are advised to read all questions in each subject before they start attempting the question paper.
3. Each question carries 4 marks. For each correct response, the candidate will get 4 marks, for wrong answer -1 marks.
4. Use Blue/Black Ball point Pen only for writing particulars on this pages/marking response on Answer sheet.
5. Rough work is to be done in the space provided for this purpose in the Test Booklet itself.
6. On completion of the test candidate must hand over the test sheet and Answer Sheet (OMR) to the Invigilator before leaving the Room/Hall.
7. Candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet/Answer Sheet.
8. Use of white fluid for correction NOT permissible on the Answer Sheet.
9. Each candidate must show on demand his/her Admit card to the Invigilator.
10. No candidate, without special permission of the centre Superintendent & Invigilator, would leave his/her seat.
11. Candidates should not leave the Examination Hall Without handing over their Test Paper & Answer sheet to the Invigilator on duty and sign (with time) the Attendance Sheet.
13. Use of Electronic/Manual Calculator is prohibited.
14. Candidates are governed by all Rules and Regulations of the examination with regards to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per the Rules and Regulations of this examination.
15. **No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.**

Name of the Candidate (In Capitals): _____ Class: _____

Roll Number: _____

In Word: _____

Centre of Examination (In Capitals): _____

Candidate's Signature: _____ Invigilator's Signature: _____

SECTION A – CHEMISTRY

Q1. The IUPAC name of $\text{CH}_3\text{-CH=C-CH}_2\text{-CHOCH}_3\text{-CH=C-CH}_2\text{-CHO}$ is:

CH_3CH_3

- (a) 2-methylbut-2-en-1-al (b) 3-methylbut-2-en-1-al
(c) 2-methylpent-2-en-1-al (d) 3-methylpent-2-en-1-al

Q2. Which of the following has the highest electron affinity?

- (a) F (b) Cl (c) Br (d) I

Q3. The ratio of $\sigma\sigma$ and $\pi\pi$ bonds in benzene is:

- (a) 2 (b) 4 (c) 6 (d) 8

Q4. In which of the following complexes does the central metal have d^2sp^3 hybridization?

- (a) $[\text{FeF}_6]^{3-}$ – $[\text{FeF}_6]^{3-}$ (b) $[\text{CoF}_6]^{3-}$ – $[\text{CoF}_6]^{3-}$
(c) $[\text{Co}(\text{NH}_3)_6]^{3+}$ – $[\text{Co}(\text{NH}_3)_6]^{3+}$ (d) $[\text{Ni}(\text{CN})_4]^{2-}$ – $[\text{Ni}(\text{CN})_4]^{2-}$

Q5. The volume of 0.1 M H_2SO_4 required to neutralize 50 mL of 0.2 M NaOH is:

- (a) 25 mL (b) 50 mL (c) 75 mL (d) 100 mL

Q6. Which of the following is not a colligative property?

- (a) Relative lowering of vapor pressure (b) Osmotic pressure
(c) Elevation in boiling point (d) Electrical conductivity

Q7. For a reaction $2A \rightarrow B$, rate = $k[A]^2$. If concentration of A is doubled, rate becomes:

- (a) Same (b) Doubled (c) Four times (d) Halved

Q8. The number of unpaired electrons in Fe^{2+} ($Z = 26$) is:

- (a) 4 (b) 5 (c) 6 (d) 3

Q9. Which of the following will give iodoform test?

- (a) $\text{CH}_3\text{CH}_2\text{OH}$ (b) $\text{CH}_3\text{CH}_2\text{CHO}$
(c) $\text{C}_6\text{H}_5\text{OH}$ (d) CH_3COOH

Q10. The product formed when phenol is treated with bromine water is:

- (a) 2,4-dibromophenol (b) 2,4,6-tribromophenol
(c) p-bromophenol (d) m-bromophenol

Q11. In Freundlich adsorption isotherm $x/m = kP^{1/n}$, the value of $1/n$ is between:

- (a) 0 and 1 (b) 1 and 2 (c) 2 and 3 (d) 3 and 4

Q12. Which of the following is used as an antiknock agent?

- (a) TEL (b) TML (c) DDT (d) BHT

Q13. The number of σ bonds in P_4O_{10} is:

- (a) 16 (b) 17 (c) 18 (d) 19

Q14. When KCl is dissolved in water, the temperature decreases. The process is:

- (a) Exothermic (b) Endothermic (c) Neither (d) Can't say

Q15. Which of the following is not a pyrimidine base?

- (a) Uracil (b) Thymine (c) Cytosine (d) Adenine

Q16. The magnetic moment of $[\text{NiCl}_4]^{2-}$ is about:

- (a) 0 BM (b) 2.82 BM (c) 3.87 BM (d) 4.90 BM

Q17. Which of the following is most acidic?

- (a) Phenol (b) p-nitrophenol
(c) m-nitrophenol (d) o-nitrophenol

Q18. The geometry of XeF_4 is:

- (a) Tetrahedral (b) Square planar
(c) Trigonal bipyramidal (d) Octahedral

Q19. The polymer used in making non-stick cookware is:

- (a) PVC (b) Teflon (c) Bakelite (d) Nylon-6,6

Q20. The correct order of basicity in aqueous medium is:

- (a) $\text{NH}_3 < \text{CH}_3\text{NH}_2 < (\text{CH}_3)_2\text{NH}$ (b) $(\text{CH}_3)_2\text{NH} < \text{CH}_3\text{NH}_2 < \text{NH}_3$
(c) $\text{CH}_3\text{NH}_2 < \text{NH}_3 < (\text{CH}_3)_2\text{NH}$ (d) $\text{NH}_3 < (\text{CH}_3)_2\text{NH} < \text{CH}_3\text{NH}_2$

SECTION B - Maths (Attempt either section-B or section-E)(Maths or Biology)

21. Let R be a relation on the set N of natural numbers defined by nRm if n divides m. Then R is

- (a) Reflexive and symmetric (b) Transitive and symmetric
(c) Equivalence (d) Reflexive, transitive but not symmetric

22. Let $f : [2, \infty) \rightarrow \mathbf{R}$ be the function defined by $f(x) = x^2 - 4x + 5$, then the range of f is

- (a) R (b) $[1, \infty)$ (c) $[4, \infty)$ (d) $[5, \infty)$

23.) If $x = t^2$, $y = t^3$, then $d^2y/dx^2 =$

- a. $3/2$
b. $3/4t$
c. $3/2t$
d. $3t/2$

24) The value of c in Rolle's theorem for the function, $f(x) = \sin 2x$ in $[0, \pi/2]$ is

- a. $\pi/4$
b. $\pi/6$
c. $\pi/2$
d. $\pi/3$

25.) If $y = ax^2 + b$, then dy/dx at $x = 2$ is equal to

- a. $2a$
b. $3a$
c. $4a$
d. None of these

26. What is the degree of differential equation $(y''')^2 + (y'')^3 + (y')^4 + y^5 = 0$?

- A. 2 B. 3 C. 4 D. 5

Q.27: What is the differential equation of the family of circles touching the y-axis at the origin?

- A. $2xyy' + x^2 = y^2$ B. $2xyy'' + x' = y^2$
C. $2xyy' - x^2 = y^2$ D. $xyy' + x^2 = y$

28: Solution of differential equation $x.dy - y.dx = Q$ represents:

- A. a rectangular hyperbola B. parabola whose vertex is at the origin
C. straight line passing through the origin D. a circle whose centre is at the origin

Q.29: Region represented by $x \geq 0, y \geq 0$ is:

- A. first quadrant B. second quadrant
C. third quadrant D. fourth quadrant

Q.30: The objective function of a linear programming problem is:

- A. a constraint B. function to be optimized
C. A relation between the variables D. None of these

Q.31: The linear inequalities or equations or restrictions on the variables of a linear programming problem are called:

- A. a constraint B. Decision variables
C. Objective function D. None of the above

Q.32: A set of values of decision variables that satisfies the linear constraints and non-negativity conditions of an L.P.P. is called its:

- A. Unbounded solution B. Optimum solution
C. Feasible solution D. None of these

Q.33: The maximum value of $Z = 3x + 4y$ subjected to constraints $x + y \leq 4, x \geq 0$ and $y \geq 0$ is:

- A. 12 B. 14 C. 16 D. None of the above

Q.34: The position vector of the point (1, 2, 0) is:

- A. $i + j + k$ B. $i + 2j + k$ C. $i + 2j$ D. $2j + k$

Q.35: The magnitude of the vector $6i + 2j + 3k$ is equal to:

- A. 5 B. 1 C. 7 D. 12

Q.36: What is the magnitude of vector $-3i + 5j$?

- A. $\sqrt{34}$ B. $\sqrt{32}$ C. $\sqrt{8}$ D. $\sqrt{16}$

Q.37: If $|a \times b| = 4$ and $|a \cdot b| = 2$, then $|a|^2 |b|^2$ is equal to:

- A. 4 B. 6 C. 20 D. 2

Q.38: A point from a vector starts is called _____ and where it ends is called its _____.

- A. terminal point, endpoint. B. initial point, terminal point
C. origin, endpoint D. initial point, endpoint

Q.39: Time period is a _____.

- A. Vector quantity B. Scalar quantity
C. Neither scalar nor vector D. None of these

Q.40: What is the magnitude of vector, $v = 1/\sqrt{3} i + 1/\sqrt{3} j + 1/\sqrt{3} k$?

- A. 0 B. 1 C. 2 D. 3

SECTION C – PHYSICS

Q41. A particle is moving with velocity $\vec{v} = k(y\hat{i} + x\hat{j})$ where k is a constant. The general equation for its path is:

- (a) $y = x^2 + \text{constant}$ (b) $y^2 = x + \text{constant}$
(c) $xy = \text{constant}$ (d) $y^2 = x^2 + \text{constant}$

Q42. A Carnot engine operates between temperatures 600 K and 300 K. If it absorbs 200 J of heat at higher temperature, the work done per cycle is:

- (a) 100 J (b) 150 J (c) 200 J (d) 50 J

Q43. A parallel plate capacitor with air between plates has capacitance C . If a dielectric slab of dielectric constant K and thickness equal to one-fourth of plate separation is inserted, the new capacitance is:

- (a) $4CK + 3K + 34C$ (b) $4K3K + 13K + 14CK$
(c) $KCK + 3K + 3KC$ (d) $4K3K + 1C3K + 14KC$

Q44. A proton and an alpha particle are accelerated through the same potential difference. The ratio of their de Broglie wavelengths is:

- (a) 2:12:1 (b) 22:122:1
(c) 4:14:1 (d) 1:221:22

Q45. A thin convex lens of focal length f is split into two halves. One half is shifted along the optical axis. An object is placed at distance $2f$ from the lens on the axis. The image formed will be:

- (a) Single real image (b) Two real images
(c) One real and one virtual (d) Two virtual images

Q46. In Young's double slit experiment, the slits are 0.5 mm apart and interference is observed on a screen 1 m away. If wavelength of light is 5000 \AA , the distance between the third bright fringe and the central maximum is:

- (a) 1.5 mm (b) 3.0 mm (c) 4.5 mm (d) 6.0 mm

Q47. An AC voltage $V = 200 \sin(100\pi t)$ is applied to a series LCR circuit with $R = 10 \Omega$, $L = 10 \text{ mH}$, $C = 500 \mu\text{F}$. The power dissipated is:

- (a) 4000 W (b) 2000 W (c) 1000 W (d) 500 W

Q48. A radioactive sample decays with mean life τ . The time required for 75% decay is:

- (a) $\tau \ln 2$ (b) $\tau \ln 4$
(c) $2\tau \ln 2$ (d) $\tau \ln 4$

Q49. Two wires of same material have lengths L and $2L$ and cross-sectional areas A and $A/2$. If they are connected in parallel to a voltage source, the ratio of heat produced in them is:

- (a) 1 : 2 (b) 2 : 1 (c) 1 : 4 (d) 4 : 1

Q50. For a given thermocouple, the neutral temperature is 300°C and the temperature of inversion is 600°C . The temperature of the cold junction is:

- (a) 100°C (b) 150°C (c) 0°C (d) 50°C

Q51. An electron and a proton enter a uniform magnetic field perpendicularly with the same speed. The ratio of their radii of path is:

- (a) 1:11:1 (b) 1:18361:1836
(c) 1836:11836:1 (d) 1:431:43

Q52. A monoatomic gas at pressure P and volume V undergoes an adiabatic process to volume $2V$. The final pressure is: (given $\gamma=5/3$)

- (a) $P/25$ (b) $25/3P$
(c) P (d) $P/2$

Q53. A satellite revolves in an orbit close to Earth's surface. If its kinetic energy is K , then its total energy is:

- (a) $-K$ (b) K (c) $2K$ (d) $-K/2$

Q54. In a diffraction grating, the second order spectrum for wavelength 500 nm is formed at an angle 30° . The number of lines per cm is:

- (a) 5000 (b) 10000 (c) 12500 (d) 25000

Q55. A particle starts from origin at $t=0$ with velocity $5i + 3j$ m/s and moves under acceleration $a = (2i + 3j)$ m/s². At $t=2$ s, its distance from origin is:

- (a) 10 m (b) 164 m (c) 180 m (d) 14 m

Q56. A wire of length L and resistance R is stretched to double its length. The new resistance is:

- (a) R (b) $2R$ (c) $4R$ (d) $8R$

Q57. A photoelectric surface has work function 2.2 eV. The threshold frequency is approximately:

- (a) 5.3×10^{14} Hz (b) 8.2×10^{14} Hz
(c) 1.6×10^{14} Hz (d) 3.5×10^{14} Hz

Q58. A small magnet is placed perpendicular to a uniform magnetic field. It experiences:

- (a) a torque but no force (b) a force but no torque
(c) both force and torque (d) neither force nor torque

Q59. An electric dipole of dipole moment p is placed in a uniform electric field E at angle θ . The potential energy of the dipole is:

- (a) $pE \cos \theta$ (b) $pE \sin \theta$
(c) $-pE \cos \theta$ (d) $-pE \sin \theta$

Q60. A body of mass 2 kg moving at 3 m/s collides with a body of mass 1 kg at rest. After collision, they move together. The loss in kinetic energy is:

- (a) 1 J (b) 2 J (c) 3 J (d) 4 J

SECTION D – MENTAL ABILITY

61. Find the missing number: 2, 6, 12, 20, ?
A) 28 B) 30 C) 32 D) 36

62. If A means +, B means -, C means \times , D means \div , then $6 C 3 A 4 D 2 =$
A) 16 B) 18 C) 20 D) 22
63. Choose the odd one out: 16, 25, 36, 49, 64, 81, 100, 121
A) 36 B) 64 C) 100 D) 121
64. Complete the series: Z, W, T, Q, ?
A) N B) M C) L D) K
65. If MANGO is coded as 50, then ORANGE is coded as
A) 60 B) 63 C) 65 D) 70
66. Pointing to a photo, a man says, "He is the son of my sister's father." Who is he?
A) Cousin B) Brother C) Nephew D) Uncle
67. How many triangles in this figure (assume simplest grid)?
<image not possible here>
A) 8 B) 10 C) 12 D) 13
68. If 1st Jan 2023 is Sunday, what day is 1st June 2023?
A) Thursday B) Friday C) Saturday D) Sunday
69. Find the next term: 1, 2, 5, 14, 41, ?
A) 122 B) 123 C) 124 D) 125
70. Which word does NOT belong?
A) Car B) Cycle C) Bike D) Truck
71. If $P \times Q$ means P is the father of Q; $P + Q$ means P is the mother of Q; then which means X is the grandmother of Z?
A) $X \times Y + Z$ B) $X + Y \times Z$ C) $X + Y + Z$ D) $X \times Y \times Z$
72. Find the missing letter: A, C, E, G, ?
A) H B) I C) J D) K
73. Statement: All cats are dogs. Some dogs are rats. \rightarrow Some cats are rats?
A) True B) False C) Can't say D) None
74. How many squares in a 4×4 chessboard?
A) 16 B) 30 C) 40 D) 50
75. If '-' means '+', '+' means ' \times ', ' \times ' means ' \div ', ' \div ' means '-', then $6 + 3 - 4 \times 2 =$
A) 10 B) 12 C) 16 D) 20
76. Find the next: 2, 3, 5, 7, 11, ?
A) 13 B) 15 C) 17 D) 19
77. In a code, PEN = 16, BOOK = 22, then COPY = ?
A) 30 B) 32 C) 34 D) 36
78. A clock shows 3:15. Angle between hands?
A) 0° B) 7.5° C) 15° D) 30°
79. If South becomes North-West, West becomes North-East, then North becomes?
A) South-East B) South-West C) North-East D) East
80. What's the minimum number of straight lines?
<image not possible>
A) 5 B) 6 C) 7 D) 8

{ SECTION E }– BIOLOGY(Attempt either section-B or section-E)(Maths or Biology)

Q81. Which enzyme is responsible for fixing CO₂ in C₄ plants in mesophyll cells?

- (a) RuBisCO (b) PEP carboxylase
(c) Pyruvate dehydrogenase (d) Malate dehydrogenase

Q82. In humans, the hormone that stimulates glycogenolysis in liver is:

- (a) Insulin (b) Glucagon (c) Thyroxine (d) Estrogen

Q83. Bowman's capsule is part of:

- (a) Alveoli (b) Nephron (c) Heart (d) Neuron

Q84. Photosystem II has an absorption maxima at:

- (a) 700 nm (b) 680 nm (c) 650 nm (d) 550 nm

Q85. Which of the following is a stop codon?

- (a) UGA (b) UGG (c) UGU (d) UGC

Q86. The site of fertilization in humans is:

- (a) Ovary (b) Uterus (c) Fallopian tube (d) Cervix

Q87. Restriction enzyme EcoRI cuts DNA at:

- (a) 5'-GAATTC-3' (b) 5'-GGATCC-3' (c) 5'-AAGCTT-3' (d) 5'-AGCT-3'

Q88. The enzyme that joins DNA fragments is:

- (a) DNA polymerase (b) DNA ligase (c) Helicase (d) Primase

Q89. Turner syndrome is due to:

- (a) 45, X (b) 47, XXY (c) 47, XYY (d) 47, XXX

Q90. Which of the following is a secondary lymphoid organ?

- (a) Bone marrow (b) Thymus (c) Spleen (d) Liver

Q91. Depletion of ozone layer is caused by:

- (a) CO₂ (b) CFCs (c) SO₂ (d) NH₃

Q92. A plant showing whorled phyllotaxy is:

- (a) Mustard (b) China rose (c) Alstonia (d) Calotropis

Q93. The stage of mitosis when chromosomes align at equator is:

- (a) Prophase (b) Metaphase (c) Anaphase (d) Telophase

Q94. Which hormone is responsible for apical dominance?

- (a) Auxin (b) Gibberellin (c) Cytokinin (d) Ethylene

Q95. A normal human male has how many Barr bodies?

- (a) 0 (b) 1 (c) 2 (d) 3

Q96. Which of the following is not a part of the axial skeleton?

- (a) Skull (b) Ribs (c) Vertebral column (d) Pelvic girdle

Q97. The tissue responsible for secondary growth in plants is:

(a) Apical meristem (b) Lateral meristem (c) Intercalary meristem (d) Parenchyma

Q98. Blood group AB has:

(a) Anti-A antibody (b) Anti-B antibody (c) Both anti-A and anti-B (d) No antibodies

Q99. Darwin's finches show:

(a) Adaptive radiation (b) Convergent evolution

(c) Divergent evolution (d) Both (a) and (c)

Q100. The functional unit of the kidney is:

(a) Ureter (b) Neuron (c) Nephron (d) Alveolus
