Test Booklet No. _____

This booklet consists of 150 questions and pages.

RGUPET/2025/1004/107

RGUPET 2025
Common Entrance Test, 2025
DOCTOR OF PHILOSOPHY IN GEOLOGY

Full Marks: 150 **Time: 3 Hours**

Roll No. | | | | | | | | |

Day and Date of Examination: _____

Signature of Invigilator(s) _____

Signature of Candidate _____

General Instructions:

PLEASE READ ALL THE INSTRUCTIONS CAREFULLY BEFORE MAKING ANY ENTRY.

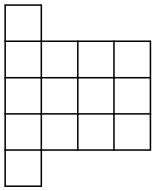
1. DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO.
2. Candidate must write his/her Roll Number on the space provided.
3. This Test Booklet contains 150 Multiple Choice Questions (MCQs) from the concerned subject. Each question carries 1 mark.
4. Please check the Test Booklet to verify that the total pages and total number of questions contained in the test booklet are the same as those printed on the top of the first page. Also check whether the questions are in sequential order or not.
5. Candidates are not permitted to enter into the examination hall after the commencement of the entrance test or leave the examination hall before completion of Examination.
6. Making any identification mark in the OMR Answer Sheet or writing Roll Number anywhere other than the specified places will lead to disqualification of the candidate.
7. Candidates shall maintain silence inside and outside the examination hall. If candidates are found violating the instructions mentioned herein or announced in the examination hall, they will be summarily disqualified from the entrance test.
8. In case of any dispute, the decision of the Entrance Test Committee shall be final and binding.
9. The OMR Answer Sheet consists of two copies, the Original copy and the Student's copy.

1	The "Mission Sudarshan Chakra", recently launched by the Prime Minister of India, primarily relates to				development of a multilayered air and missile defence system
	a) a national renewable energy mission	b) a national digital currency mission	c) development of a multilayered air and missile defence system	d) a national mission to modernise Indian Railways	(c)
2	"Pushpak"- a national mission being implemented by the Indian Institute of Technology, Bombay is related to the development of				Drone technology
	a) Helicopters	b) Dairy technology	c) Drone technology	d) Artificial intelligence	c)
3	North East India's first underwater tunnel project, announced in 2024, is proposed to connect				Numaligarh and Gohpur
	a) Dibrugarh and Dhemaji	b) Jorhat and Majuli	c) Numaligarh and Gohpur	d) Guwahati and North Guwahati	c)
4	Which of the following statements are correct? A. Canada hosted the 51st G7 summit in 2025. B. Four players were honoured with the Khel Ratna Award 2025. C. Sweden was ranked first in Global Innovation Index 2024. D. Operation Sindoor was Launched by India to attack terrorist bases in Pakistan on 7th May 2025.				(a)
	a) A, B and D	b) A,B and C	c) Only A	d) All of the above	A, B and D
5	Which of the followings are correct? A. Lip Butan has been appointed as the new CEO of Intel in March 2025 B. Shri C P Radhakrishnan has been appointed as the Vice President of India C. India's rank in the Human Development Index 2025 released by UNDP is 99 D. India has become the 2nd largest road network in the World.				(d)
	a) A and B only	b) A, B and C only	c) A, C and D only	d) A, B, D only	A, B, D only
6	Which of the following sentences is false? A. Palk Strait joins India and Sri Lanka B. The Radcliffe Line is between India and Bangladesh C. The MacMohan Line separates India and China D. The Durand Line is between Iran and Afghanistan.				
	a) A, B	b) B, C	c) C, D	d) B, D	(d)
7	Assertion (A): Eclipses do not occur on all full moon and new moon days. Reason (R): The moon revolves round the earth in an elliptical orbit.				A and R are true but R doesnot explain A
	a) A and R are true and R correctly explains A.	b) A and R are true but R does not explain A.	c) A is true R is false	d) R is true but A is false	(b)

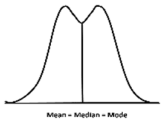
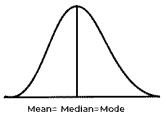
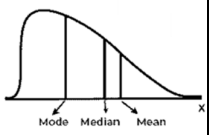
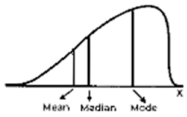
<table>
<tr><td>8</td><td colspan="4">Right to equality is a-</td><td>Fundamental right</td></tr>
<tr><td></td><td>a) fundamental right</td><td>b) social right</td><td>c) cultural right</td><td>d) legal right</td><td>(a)</td></tr>
<tr><td>9</td><td colspan="4">The author of the book “Midnight’s Children” is-</td><td>Salman Rushdie</td></tr>
<tr><td></td><td>a) Shakespeare</td><td>b) Leo Tolostoy</td><td>c) Salman Rushdie</td><td>d) R K Narayan</td><td>(c)</td></tr>
<tr><td>10</td><td colspan="4">Match the organizations with their headquarters:

<table><tr><td>A. UNESCO</td><td>1. New York</td></tr><tr><td>B. WHO</td><td>2. Paris</td></tr><tr><td>C. UNICEF</td><td>3. Geneva</td></tr><tr><td>D. IMF</td><td>4. Washington D.C.</td></tr></table></td><td></td></tr>
<tr><td></td><td>a) A–3, B–2, C–4, D–1</td><td>b) A–2, B–3, C–1, D–4</td><td>c) A–2, B–4, C–3, D–1</td><td>d) A–1, B–3, C–2, D–4</td><td>(b)</td></tr>
<tr><td>11</td><td colspan="4">He said, “Happy new year!”
The correct indirect speech of the above is-</td><td>He wished me a happy new year.</td></tr>
<tr><td></td><td>a) He said the new year was happy.</td><td>b) He wished me a happy new year.</td><td>c) He said to me that happy new year.</td><td>d) I was wished a happy new year.</td><td>(b)</td></tr>
<tr><td>12</td><td colspan="4">Identify the correct sentence(s) from the following.
A. One of my friends is a doctor.
B. I don’t know nothing about her.
C. It is a two-hour journey.
D. We will be definitely there at the yesterday’s programme.</td><td></td></tr>
<tr><td></td><td>a) A, B</td><td>b) B, C</td><td>c) A, C</td><td>d) C, D</td><td>(c)</td></tr>
<tr><td>13</td><td colspan="4">“She drank the _____ milk that was there in the flask.” The appropriate quantifier to fill in the blank is-</td><td>little</td></tr>
<tr><td></td><td>a) all</td><td>b) little</td><td>c) sour</td><td>d) few</td><td>(b)</td></tr>
<tr><td>14</td><td colspan="4">“a/ great /and/ reality/their/ theory/in/there/ disparity/is”
The correct reordered meaningful sentence with the above jumbled words/phrases is-
P. There is a great theory and their reality in disparity.
Q. There is a great disparity in their theory and reality.
R. Their great disparity is in a theory and reality there.
S. Their great theory is a reality and in disparity there.</td><td>There is a great disparity in their theory and reality.</td></tr>
<tr><td></td><td>a) P</td><td>b) Q</td><td>c) R</td><td>d) S</td><td>(b)</td></tr>
<tr><td>15</td><td colspan="4">The correct match of synonyms and antonyms is:

<table><tr><td>A. Futile</td><td>i. Help</td></tr><tr><td>B. Generic</td><td>ii. Effective</td></tr><tr><td>C. Hinder</td><td>iii. Individual</td></tr><tr><td>D. Inception</td><td>iv. Termination</td></tr></table></td><td>A-ii, B-iii, C-i, D-iv</td></tr>
<tr><td></td><td>a) A-i, B-ii, C-iii, D-iv</td><td>b) A-iii, B-ii, C-iv, D-iii</td><td>c) A-iv, B-iii, C-i, D-ii</td><td>d) A-ii, B-iii, C-i, D-iv</td><td>(d)</td></tr>
</table>

16	The total number of squares in the following figure is: 				22
	a) 24	b) 20	c) 22	d) 18	(c)
17	Fill in the blank in the following pattern. ELFY GLHX ILJW -------- MLNU				KLLV
	a) KLLV	b) KLMX	c) JLLV	d) JLMX	a)
18	Raghav introduces Vineet as the only son of the only brother of his father's wife. How Raghav and Vineet are related?				cousin
	a) brother	b) cousin	c) uncle	d) son-in-law	(b)
19	Which two numbers should be interchanged to make the given equation mathematically correct? $3 \times 6 + 72 \div 8 - 24 = 12$				6, 8
	a) 6, 8	b) 6, 24	c) 3, 8	d) None	(a)
20	If BANKER is coded as CAOKFR, then how would LAWYER be coded?				MAXYFR
	a) LBWZES	b) LBWYFR	c) MAXYFR	d) MAXZES	c)
21	Same error occurs at the same size in every measurement, and such errors can only be eliminated either by thinking through the sources of problems and removing them. This type of error is termed as:				
	a) Random errors	b) Systematic errors	c) Cascading errors	d) Perpetual errors	b
22	Hypothesis-driven research begins with a hypothesis. A hypothesis is a statement about the world that can be true or false, and whose truth is being tested.				
	a) A valid hypothesis is based on 'that exists'	b) A hypothesis is a positive conclusion	c) A hypothesis can never be tested	d) A valid hypothesis must be falsifiable	d
23	Which of the following statements that could be considered as valid scientific hypotheses? A. Eating two ounces of olive oil a day decreases the odds of contracting heart disease. B. What is the best fertilizer to use to get large and tasty tomatoes? C. Macs are better than PCs. D. Briar's Aspirin cures headaches faster than RCS Aspirin.				Answer
	a) A, B	b) A, B, C	c) A, D	d) B, C	c
24	Relate the 'function or relationship' (A) and 'comment' (B) and select the appropriate answer A: Find how the speed of sound in air at fixed pressure depends upon air temperature.				Answer

	B: The control variable is temperature, and the response variable is sound speed.				
	a) Functional relationship is correct and the comment is true for the relationship	b) Functional relationship is incorrect but the comment is true for the relationship	c) Functional relationship is correct but the comment is false for the relationship	d) Neither the functional relationship is correct nor the comment is true	a
25	Relate 'sampling design' and its 'method' Sampling Design / Method A. Deliberate — i. Sample collected as information received and survey progresses B. Simple random — ii. sample drawn from a heterogeneous group C. Stratified — iii purposive selection of particular units D. Sequential — iv. very item in the population has an equal chance of inclusion				Answer
	a) A-iii, B-iv, C-ii, D-i	b) A-ii, B-iv, C-iii, D-i	c) A-i, B-iii, C-ii, D-iv	d) A-iii, B-ii, C-iv, D-i	a
26	Number of observations in a normal distribution is 1000. How many observations will be there between $\mu+1\sigma$ and $\mu-1\sigma$				Answer
	a) 500	b) 680	c) 720	d) 950	b
27	Which of the following are reasons for citing a paper? A. use its ideas, definitions, terms in a Research B. provides upcoming facts regarding undergoing Research Question. C. to adopt part/full methodology it adopted for a certain task. D. to refer to data also used in Current Research.				Answer
	a) A, B, C	b) B, C, D	c) A, C, D	d) A, B, D	c
28	Scholars who wish to meet publication expectations mostly resort to a variety of techniques to increase their output and crank up their citation ranking, which are not considered ethical. Identify these techniques: A. Gift authorship B. Extensive experiments C. Salami Slicing D. Extensive referencing				Answer
	a)A, B, C	b) A, B, D	c) B, C, D	d) A, C, D	d
29	Match the references (APA 7 style): A. Journal Article — i. Edwards, A. A., Steacy, L. M., Siegelman, N., Rigobon, V. M., Kearns, D. M., Rueckl, J. G., & Compton, D. L. (2022). Unpacking the unique relationship between set for variability and word reading development: Examining word- and child-level predictors of performance. *Journal of Educational Psychology*, *114*(6), 1242–1256. https://doi.org/10.1037/edu0000696 B. Authored Book — ii. Levenson, H., Jinich, S., Vaz, A., & Rousmaniere, T. (2025). *Deliberate practice in emotionally focused couple therapy*. American Psychological Association. https://doi.org/10.1037/0000436-000				Answer

	C. Webpage	iii. Zeleke, W. A., Hughes, T. L., & Drozda, N. (2020). Home–school collaboration to promote mind–body health. In C. Maykel & M. A. Bray (Eds.), *Promoting mind–body health in schools: Interventions for mental health professionals* (pp. 11–26). American Psychological Association. https://doi.org/10.1037/0000157-002			
	D. Edited Book Chapter	iv. Taras, Z. (2024, May 30). *Situational irony can be funny, tragic or even terrifying.* howstuffworks. https://entertainment.howstuffworks.com/arts/literature/situational-irony.htm			
	a) A-i, B-ii, C-iv, D-iii	b) A-ii, B-iii, C-iv, D-i	c) A-iii, B-ii, C-i, D-iv	d) A-i, B-ii, C-iii, D-iv	a
30	Which one of the following refers to positive skewness?				
	a) 	b) 	c) 	d) 	c
31	How much is the degree of freedom for the following data table?				Answer
	a) 8	b) 9	c) 10	d) 18	b
32	Find out the Null hypothesis for the given table				Answer
	a) $\mu_{H0} = 578$kg.	b) $\mu_{H0} \neq 578$kg.	c) $\mu_{H0} = -578$kg.	d) $\mu_{H0} = \pm 578$kg.	a
33	What will be sum of the deviations of observations from the regression line?				Answer
	a) -∞	b) 0	c) +∞	d) undefined	b
34	Derive from the following diagram				Answer

S. No.	X_i	Hypothesised mean $m_{H_0} = 578$ kg.	$D_i = (X_i - \mu_{H_0})$	D_i^2
5	572	578	–6	36
6	578	578	0	0
7	570	578	–8	64
8	572	578	–6	36
9	596	578	18	324
10	544	578	–34	1156
$n = 10$			$\sum D_i = -60$	$\sum D_i^2 = 1816$

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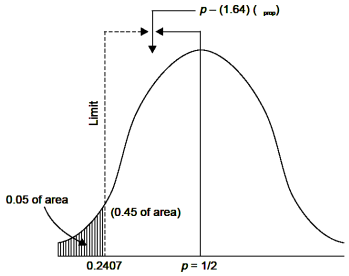
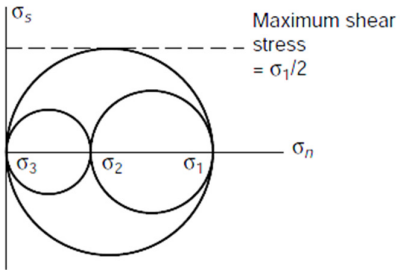


	Assertion: In this normal distribution 5 percent of the sample are rejected. Justification: It shows a two tailed hypothesis test model at 90 percent confidence level				
	a) Assertion is true and justification explains the Assertion	b) Assertion is false but justification explains the Assertion	c) Assertion is true and justification is true but does not explain the Assertion	d) Assertion is true and justification for the Assertion is incorrect	d
35	Match into pairs for the Statistical method with appropriate details mentioned: Statistical method — Details A. Correlation — i. Order 2, 3, 4, ……. B. Polynomial regression — ii. More than two population on same characteristics C. ANOVA — iii. Test of homogeneity D. Chi square — iv. Requires only two variables				Answer
	a) A-i, B-ii, C-iii, D-iv	b) A-iv, B-i, C-ii, D-iii	c) A-iv, B-ii, C-i, D-iii	d) A-iii, B-i, C-ii, D-iv	b
36	Match the following and give the correct answer: A. Nature of Interaction holding atom — i Kinetics B. Rate of Chemical Reaction — ii Bond C. Increase the rate of reaction — iii Lipid D. hydrocarbon chain insoluble in water — iv catalyst				Answer
	a) A(i), B(ii), C(iii), D(iv)	b) A(ii), B(i), C(iv), D(iii)	c) A(iii), B(ii), C(i), D(iv)	d) A(ii), B(iii), C(i), D(iv)	(b)
37	A block slides down a frictionless inclined plane. Which of the following statements is true?				Answer
	a) Mechanical energy is not conserved	b) Potential energy decreases, kinetic energy increases	c) Kinetic energy decreases	d)Acceleration is zero	(b)
38	Which of the following is true for a photon in a vacuum?				Answer
	a) It has mass but no energy	b) It has energy but no rest mass	c) It has rest mass and energy	d) It can be accelerated by a force	(b)
39	In which of the following compounds is the **metal-metal bonding present?**				Answer
	a) NaCl	b) ZnO	c) Al_2O_3	d) Cr_2Cl_6	(d)
40	A solution contains 0.1 mol of a non-volatile solute in 1 L of water at 298 K. Calculate the osmotic pressure:				Answer
	a) 2.44 atm	b) 1.33 atm	c) 0.22 atm	d) 0.11 atm	(a)

41	According to Henry's law, the solubility of a gas in a liquid is:				Answer
	a) Independent of pressure.	b) Directly proportional to pressure.	c) Inversely proportional to pressure.	d) Exponential with pressure.	(b)
42	If $f(x) = \begin{cases} \{\lvert x-2\rvert)/(x-2)\}, & x \neq 0 \\ 0, & otherwise \end{cases}$				Answer
	a) -1	b) 1	c) 0	d) does not exist	d
43	If $y = x^5 - 5x^4 + 5x^3 - 1$, then the value of $\frac{d^6y}{dx^6}$ is				Answer
	a) $120x - 120$	b) 120	c) 0	d) cannot be evaluated.	c
44	A group which satisfies commutatively property is known a				
	a) Abelian group	b) Quotient group	c) Coset group	d) Normal group	a
45	Let M^T denotes transpose matrix of M and I is identity matrix. Match the following: A. M is idempotent — i. $M = M^T$ B. M is symmetric — ii. $M = -M^T$ C. M is skew-symmetric — iii. $M^2 = I$ D. M is involution — iv. $M^2 = M$				Answer
	a) A-iv, B-i, C-iii, D-ii	b) A-i, B-iv, C-ii, D-iii	c) A-iv, B-i, C-ii, D-iii	d) A-iv, B-ii, C-i, D-iii	c
46	Relate the statements: A: Assertion–SSDs are faster than HDDs. B: Justification–Because SSDs use flash memory instead of spinning disks.				Answer
	a) Both A and B are true, and B is the correct explanation of A	b) Both A and B are true, but B is NOT the correct explanation of A	c) A is true, but B is false	d) A is false, but B is true	(a)
47	Match the pairs: A. Machine Learning — i Enables machines to understand and process human language B. Natural Language Processing (NLP) — ii Uses data to learn and improve predictions automatically C. Computer Vision — iii Analyzes and interprets visual data like images and videos D. Expert Systems — iv Mimics human decision-making using rules and knowledge base				Answer
	a) A – iv, B – i, C – iii, D – ii.	b) A – iv, B – iii, C – i, D – ii.	c) A – ii, B – i, C – iii, D – iv.	d) A – iii, B – i, C – iv, D – ii.	(c)
48	Which programming language is widely used for AI and ML development?				Answer
	a) Python	b) JavaScript	c) C#	d) HTML	(a)
49	Which of the following statement is true:				Answer
	a) A byte is made up of 16 bits.	b) ROM is volatile memory that loses data when	c) A compiler translates high-level code into	d) A firewall is used to protect a computer network	(d)

		power is switched off.	machine code line by line.	from unauthorized access.	
50	What is a network of networks called?				Answer
	a) Intranet	b) Internet	c) WAN	d) LAN	(b)
51	Plastic deformation is represented by which of the following?				Permanent change in shape and size.
	a) Permanent change in shape	b) Permanent change in size	c) Temporary change in shape and size.	d) Permanent change in shape and size.	d
52	Match the following: A. Young's modulus — i. Ratio of hydrostatic pressure to volume strain B. Bulk modulus — ii. Ratio of compressive stress to longitudinal strain C. Shear modulus — iii. Negative ratio of transverse strain to axial strain D. Poisson's ratio — iv. Ratio of shear stress to shear strain				A-ii, B-i, C-iv, D-iii
	a) A-i, B-ii, C-iii, D-iv	b) A-iv, B-ii, C-iii, D-i	c) A-ii, B-i, C-iv, D-iii	d) A-iii, B-ii, C-iv, D-i	c
53	Choose the correct statement(s) about stress: A. The three principal stresses (σ_1, σ_2 and σ_3) are mutually perpendicular. B. The relationship $\sigma_1 > \sigma_2 > \sigma_3$ is always true. C. Shear stress is always zero on principal planes D. Difference between σ_1 and σ_3 is deviatoric stress.				A & C only
	a) A only	b) A & B only	c) A & C only	d) B & D only	c
54	For the following Assertion (A) and Justification (B), choose the correct option. **A:** The state of stress at a point can be described by a single vector. **B:** Stress vector associated with any one plane passing through the point is sufficient to describe the state of stress at the point.				Both A and B are false
	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	d
55	The Mohr diagram in the given figure represents which state of stress?				Biaxial stress

					
	a) Uniaxial stress.	b) Biaxial stress.	c) Triaxial stress.	d) Pure shear stress	b
56	Which of the following is responsible for the formation of Andes Mountain?				Convergence of oceanic and continental plates
	a) Convergence of two oceanic plates	b) Convergence of oceanic and continental plates	c) Convergence of two continental plates	d) Divergence of two oceanic plates	b
57	Match the following structures with plate movement. A. Aulacogen — i. Ocean-ocean divergence B. Suture — ii. Ocean-ocean convergence C. Island arc — iii. Continent-continent convergence D. Mid-oceanic ridge — iv. Continental rifting				A-iv, B-iii, C-ii, D-i
	a) A-iii, B-i, C-ii, D-iv	b) A-iv, B-ii, C-iii, D-i	c) A-iv, B-iii, C-ii, D-i	d) A-iii, B-i, C-iv, D-ii	c
58	Choose the correct statement(s) from the following. A. Continental plates cannot subduct because of high buoyancy. B. Benioff zones can extend up to boundary between upper and lower mantle. C. RRR is the most stable triple junction. D. Horst and Graben are associated with rifting.				All are correct.
	a) A only	b) B & D only	c) A, B and C only	d) All are correct.	d
59	For the following Assertion (A) and Justification (B), choose the correct option. **A:** Oceanic lithosphere older than 200 Ma is very rare on earth. **B:** New oceanic crust form continuously at mid-oceanic ridges.				Both A and B are true, but B is not the correct explanation

<table>
<tr><td></td><td>a) Both A and B are true, and B is the correct explanation</td><td>b) Both A and B are true, but B is not the correct explanation</td><td>c) A is True but B is false</td><td>d) Both A and B are false</td><td>b</td></tr>
<tr><td>60</td><td colspan="4">Which was the earliest well documented supercontinent, that formed at 1.1 Ga and fragmented at 900 Ma?</td><td>Rodinia</td></tr>
<tr><td></td><td>a) Rodinia</td><td>b) Penotia</td><td>c) Pangaea</td><td>d) Gondwana</td><td>a</td></tr>
<tr><td>61</td><td colspan="4">The cement in a sandstone typically is the result of precipitation of minerals like quartz and calcite from _____. (Choose appropriate option to fill in the blank)</td><td>solution</td></tr>
<tr><td></td><td>a) the atmosphere</td><td>b) organisms</td><td>c) solution</td><td>d) flora & fauna</td><td>c</td></tr>
<tr><td>62</td><td colspan="4">Match the following sedimentary rocks with their compositions:

<table><tr><td>A. Packstone</td><td>i. <15% matrix, >25% rock fragments</td></tr><tr><td>B. Grainstone</td><td>ii. >15% matrix, >25% feldsper</td></tr><tr><td>C. Lithic arenite</td><td>iii. Grain supported, contains no mud</td></tr><tr><td>D. Arkosic wacke</td><td>iv. Grain supported, contains mud</td></tr></table></td><td>A-iv, B-iii, C-i, D-ii</td></tr>
<tr><td></td><td>a) A-iv, B-iii, C-i, D-ii</td><td>b) A-iii, B-iv, C-ii, D-i</td><td>c) A-iii, B-i, C-iv, D-ii</td><td>d) A-ii, B-iv, C-i, D-iii</td><td>a</td></tr>
<tr><td>63</td><td colspan="4">Choose the correct statements(s) about Pettijohn’s classification of sandstone.

A. Arkose contains more than 25% feldspar.
B. Greywacke contains more than 90% matrix.
C. Litharenite contains more than 25% rock fragments.
D. Quartz arenite contains more than 95% quartz.</td><td>A, C & D only</td></tr>
<tr><td></td><td>a) A & D only</td><td>b) B & C only</td><td>c) A, C & D only</td><td>d) B, C & D only</td><td>c</td></tr>
</table>

<table>
<tr><td>64</td><td colspan="4">For the following Assertion (A) and Justification (B), choose the correct option.

A: Fossils are mostly preserved in sedimentary rocks.

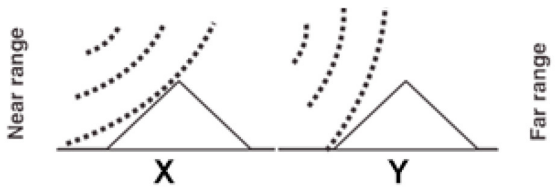
B: Sedimentary rocks do not undergo metamorphism after its deposition.</td><td>A is True but B is false</td></tr>
<tr><td></td><td>a) Both A and B are true, and B is the correct explanation</td><td>b) Both A and B are true, but B is not the correct explanation</td><td>c) A is True but B is false</td><td>d) Both A and B are false</td><td>c</td></tr>
<tr><td>65</td><td colspan="4">Formations are generally considered to be mappable at what scale?</td><td>1: 24000</td></tr>
<tr><td></td><td>a) 1: 48000</td><td>b) 1: 24000</td><td>c) 1: 12000</td><td>d) 1: 6000</td><td>b</td></tr>
<tr><td>66</td><td colspan="4">Carbonate deposition is possible in which sedimentary environment?</td><td>Anywhere above CCD depth</td></tr>
<tr><td></td><td>a) Shallow marine environment only</td><td>b) Abyssal plain</td><td>c) Lagoonal environment</td><td>d) Anywhere above CCD depth</td><td>d</td></tr>
<tr><td>67</td><td colspan="4">Match the following pairs:

<table><tr><td>A. Fluvio-glacial Neogene rocks</td><td>i. Intratrappean beds</td></tr><tr><td>B. Precambrian-Cambrian Boundary</td><td>ii. Himalayan Foreland Basin</td></tr><tr><td>C. Permian-Triassic Boundary</td><td>iii. Krol Basin</td></tr><tr><td>D. Cretaceous-Palaeogene Boundary</td><td>iv. Tethyan Basin</td></tr></table></td><td>A-ii, B-iii, C-iv, D-i</td></tr>
<tr><td></td><td>a) A-ii, B-iii, C-iv, D-i</td><td>b) A-iii, B-ii, C-I, D-iv</td><td>c) A-iv, B-I, C-iii, D-ii</td><td>d) A-iii, B-iv, C-ii, D-i</td><td>a</td></tr>
<tr><td>68</td><td colspan="4">Which of the following statements are true for poorly sorted sediment?

A. It has high value of inclusive graphic standard deviation.
B. It has high value of graphic kurtosis.
C. It has low value of inclusive graphic standard deviation.
D. It has low value of graphic kurtosis.</td><td>A & D only</td></tr>
</table>

	a) A & B only	b) C & D only	c) A & D only	d) B & C only	c
69	For the following Assertion (A) and Justification (B), choose the correct option. **A:** Without tectonic subsidence, there is no depositional environment. **B:** Tectonism represents the primary control on the creation and destruction of accommodation space.				Both A and B are true, and B is the correct explanation
	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	a
70	A Mesozoic stratigraphic sequence is characterized by the following litho-units from bottom to the top. Find the sedimentary environment. Well-sorted sandstone with bimodal paleocurrent. Sand-mud alteration with bipolar paleocurrent. Poorly sorted sandstone with unimodal paleocurrent. Top ↑				Fluvial-tidal-shoreface
	a) Glacial-lacustrine-eolian	b) Glacial-fluvial-eolian	c) Fluvial-tidal-shoreface	d) Fluvial-lacustrine-tidal	c
71	The beginning of Quaternary period coincides with which of the following magnetic polarity events?				Gauss-Matuyama polarity boundary
	a) Matuyama-Brunhes polarity boundary	b) Gauss-Matuyama polarity boundary	c) Olduvai polarity event	d) Jaramillo polarity event	b
72	Match the following stages/Ages of Quaternary period and their time of beginning. A. Calabrian — i. 2.58 Ma B. Chibanian — ii. 1.80 Ma C. Gelasian — iii. 0.774 Ma D. Northgrippian — iv. 0.0082 Ma				A-ii, B-iii, C-i, D-iv
	a) A-i, B-ii, C-iii, D-iv	b) A-iv, B-ii, C-iii, D-i	c) A-ii, B-iii, C-i, D-iv	d) A-iii, B-ii, C-iv, D-i	c
73	Which of the following statements is/are true? A. Climate change during Quaternary period leads to fluctuation in sea level. B. Astronomical forcing is one of the major causes of Quaternary climate change. C. Incoming solar radiation (insolation) remained constant during Quaternary period. D. Radiometric dating of Quaternary ice-core is not possible.				A & B only

	a) A only	b) B only	c) A & B only	d) C & D only	c
74	For the following Assertion (A) and Justification (B), choose the correct option. **A:** During glacial period seawater gets enriched in ^{18}O. **B:** Sea level is decreased during glacial period.				Both A and B are true, but B is not the correct explanation
	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	b
75	What was the position of sea level during Last Glacial Maxima as compared to present level?				120 m below
	a) 120 m below	b) 120 m above	c) 73 m below	d) At same level	a
76	Which of the following expressions states the Stefan-Boltzmann law?				$M=\sigma T^4$
	a) $M=\sigma T$	b) $M=\sigma T^2$	c) $M=\sigma T^3$	d) $M=\sigma T^4$	d
77	Match the following sensors and number of bands present. A. TM — i. Three B. LISS-3 — ii. Four C. LISS-4 — iii. Five D. OLI — iv. Eleven				A-iii, B-ii, C-i, D-iv
	a) A-i, B-ii, C-iii, D-iv	b) A-i, B-ii, C-iii, D-i	c) A-iii, B-ii, C-i, D-iv	d) A-ii, B-iv, C-iii, D-i	c
78	Which of the following statements about atmospheric window is/are true. A. It is a portion of the EMR that is transmitted through the atmosphere effectively. B. It is a portion of the atmosphere that transmits EMR effectively. C. It is a portion of the EMR that is absorbed by greenhouse gases. D. Satellite remote sensing works only in atmospheric window.				A & D only
	a) A only	b) A & D only	c) B & C only	d) A, B & D only.	b
79	For the following Assertion (A) and Justification (B), choose the correct option. **A:** Besides daytime, Radar data can be acquired during night-time also. **B:** Radar system generates its own electromagnetic radiation.				Both A and B are true, and B is the correct explanation

	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	a
80	What geometric effects do radar images produce in the following two situations (X and Y)?  				X - layover, Y - foreshortening and radar shadow
	a) X - foreshortening, Y - layover	b) X - layover and radar shadow, Y - foreshortening	c) X - radar shadow, Y - foreshortening	d) X - layover, Y - foreshortening and radar shadow	d
81	The property of a body by which it regains its original size and shape after the removal of the applied force is called ____.				elasticity
	a) plasticity	b) elasticity	c) malleability	d) ductility	b
82	Match the following factors influencing tunnel stability with their effects/considerations: A. Rock Mass Quality (RMR/Q-System) — i. Affects need for drainage and lining design B. Groundwater Conditions — ii. Determines overall stand-up time and stability of excavation C. In-situ Stresses — iii. Helps counteract rock falls and maintain tunnel stability D. Support Systems — iv. Excessive values may cause spalling, rock bursts, or squeezing ground				A-ii, B-i, C-iv, D-iii
	a) A-iv, B-iii, C-ii, D-i	b) A-i, B-ii, C-iii, D-iv	c) A-iii, B-iv, C-i, D-ii	d) A-ii, B-i, C-iv, D-iii	d

<table>
<tr><td>83</td><td colspan="4">Read the following statements and select the correct option:

A. Optimum Moisture Content (OMC) is the moisture content at which maximum dry density is obtained for a given compaction method.
B. The dry density corresponding to OMC is called Maximum Dry Density (MDD).
C. Addition of water helps by lubricating soil particle surfaces and improving soil compressibility.
D. Increasing water content always increases dry density of soil, even beyond the OMC.</td><td>A, B, and C are True; D is False</td></tr>
<tr><td></td><td>a) All statements are True</td><td>b) A, B, and C are True; D is False</td><td>c) A and B are True; C and D are False</td><td>d) Only A is True</td><td>b</td></tr>
<tr><td>84</td><td colspan="4">Read the following statements as Assertion (A) and Reason (B) and pick out the correct option given below:

A: The Uniaxial Compressive Strength (UCS) test is commonly used to determine the strength of intact rock specimens.

B: In UCS test, lateral confinement is provided to the specimen to simulate field stress conditions.</td><td>A is true, but B is false</td></tr>
<tr><td></td><td>a) Both A and B are true, and B is the correct explanation of A</td><td>b) Both A and B are true, but B is not the correct explanation of A</td><td>c) A is true, but B is false</td><td>d) A is false, but B is true</td><td>c</td></tr>
<tr><td>85</td><td colspan="4">The average unit weight of the uppermost part of the crust is 25000 N/m^3. The vertical stress at a depth of 1 km would be _____ MPa. (Choose correct option to fill in the blank).</td><td>25</td></tr>
<tr><td></td><td>a) 20</td><td>b) 25</td><td>c) 30</td><td>d) 35</td><td>b</td></tr>
<tr><td>86</td><td colspan="4">Which of the following is the indicator element for sandstone-type uranium deposit?</td><td>Selenium</td></tr>
<tr><td></td><td>a) Arsenic</td><td>b) Copper</td><td>c) Zinc</td><td>d) Selenium</td><td>d</td></tr>
<tr><td>87</td><td colspan="4">Match the following geophysical survey methods and suitable deposit types:

<table><tr><td>A. Gravity method</td><td>i. Uranium deposit</td></tr><tr><td>B. Electromagnetic method</td><td>ii. Massive sulfide deposit</td></tr><tr><td>C. Induced potential method</td><td>iii. Graphite deposit</td></tr><tr><td>D. Radiometric method</td><td>iv. Disseminated sulfide deposit</td></tr></table></td><td>A-ii, B-iii, C-iv, D-i</td></tr>
<tr><td></td><td>a) A-ii, B-iii, C-iv, D-i</td><td>b) A-i, B-ii, C-iii, D-iv</td><td>c) A-iii, B-i, C-ii, D-iv</td><td>d) A-iv, B-i, C-iii, D-ii</td><td>a</td></tr>
<tr><td>88</td><td colspan="4">Choose the correct statement(s) about gravity reduction in gravity survey.

A. Latitude correction is applied to eliminate variation of gravity with latitude.
B. Free air correction is positive for observation points above datum.</td><td>A, B & C only</td></tr>
</table>

<table>
<tr><td></td><td colspan="4">C. Bouguer correction and free air correction are applied together as combined elevation correction.
D. No correction is required for gravitational effects of Sun and Moon.</td><td></td></tr>
<tr><td></td><td>a) A only</td><td>b) A & B only</td><td>c) A, B & C only</td><td>d) All of A, B, C & D</td><td>c</td></tr>
<tr><td>89</td><td colspan="4">For the following Assertion (A) and Justification (B), choose the correct option.

A: In seismic reflection surveys, seismic energy pulses are reflected from subsurface interfaces.

B: Seismic velocity varies as a function of depth, due to the differing physical properties of the individual layers.</td><td>Both A and B are true, but B is not the correct explanation</td></tr>
<tr><td></td><td>a) Both A and B are true, and B is the correct explanation</td><td>b) Both A and B are true, but B is not the correct explanation</td><td>c) A is True but B is false</td><td>d) Both A and B are false</td><td>b</td></tr>
<tr><td>90</td><td colspan="4">A natural gamma-ray log exhibits a high response from which of the following?</td><td>Shale</td></tr>
<tr><td></td><td>a) Shale</td><td>b) Limestone</td><td>c) Dolomite</td><td>d) Coal</td><td>a</td></tr>
<tr><td>91</td><td colspan="4">The highest and lowest category of resources under UNFC System respectively have the codes _____ and _____. (Choose correct option to fill in the blanks)</td><td>(111) and (334)</td></tr>
<tr><td></td><td>a) (111) and (433)</td><td>b) (111) and (334)</td><td>c) (334) and (111)</td><td>d) (433) and (111)</td><td>b</td></tr>
<tr><td>92</td><td colspan="4">Match the following sampling methods with their suitability.

<table><tr><td>A. Channel sampling</td><td>i. Rock cuttings during drilling</td></tr><tr><td>B. Chip sampling</td><td>ii. Uniformly distributed mineralization.</td></tr><tr><td>C. Float sampling</td><td>iii. Irregularly distributed mineralization.</td></tr><tr><td>D. Sludge sampling</td><td>iv. Scanty outcrops</td></tr></table></td><td>A-ii, B-iii, C-iv, D-i</td></tr>
<tr><td></td><td>a) A-ii, B-iii, C-iv, D-i</td><td>b) A-i, B-ii, C-iii, D-iv</td><td>c) A-iii, B-iv, C-ii, D-i</td><td>d) A-ii, B-i, C-iii, D-iv</td><td>a</td></tr>
<tr><td>93</td><td colspan="4">Which of the following statements is/are true for room-and-pillar mining.

A. It is designed for flat-bedded deposits of limited thickness.
B. Pillars are left to support the hanging wall.
C. Minerals contained in pillars are non-recoverable.
D. Besides coal mining, this method is used for mining non-coal minerals also.</td><td>All are true</td></tr>
<tr><td></td><td>a) A only</td><td>b) A & B only</td><td>c) A, B & C only</td><td>d) All are true</td><td>d</td></tr>
</table>

94	For the following Assertion (A) and Justification (B), choose the correct option. **A:** Velocity of seismic waves is increased in peridotite than in granitic rocks. **B:** Density of peridotite is higher than granitic rocks.				Both A and B are true, and B is the correct explanation
	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	a
95	Shrinkage stopping is suitable for which of the following?				Firm ores with steep dip
	a) Soft metallic ores	b) Firm ores with steep dip	c) Peat and lignite	d) Placer deposits	b
96	What type of aquifer is overlain and underlain by impermeable layers?				Confined aquifer
	a) Unconfined aquifer	b) Confined aquifer	c) Perched aquifer	d) Leaky aquifer	b
97	Match the sources of groundwater pollution with their major contaminants: A. Agricultural activities — i. Heavy metals (arsenic, lead) B. Industrial effluents — ii. Nitrates and pesticides C. Domestic sewage — iii. Organic matter and pathogens D. Mining operations — iv. Acids and toxic minerals				A-ii, B-i, C-iii, D-iv
	a) A-ii, B-i, C-iii, D-iv	b) A-iii, B-ii, C-i, D-iv	c) A-ii, B-iii, C-iv, D-i	d) A-iv, B-i, C-ii, D-iii	a
98	Read the following statements about aquifers and choose the correct option: A. An aquifer is a geological formation that can store and transmit groundwater. B. Specific yield is the volume of water that a saturated rock releases by gravity per unit volume of the rock.				Both the statements are True
	a) Both the statements are True	b) A is True; B is False	c) A is False and B is true	d) Both are false	a
99	Read the following statements as Assertion (A) and Reason (B) and pick out the correct option given below: **A**: Darcy's law states that the discharge through a porous medium is directly proportional to the hydraulic gradient. **B**: This is because water flows in laminar conditions through interconnected pores of the soil or rock.				Both A and B are true, and B is the correct explanation of A
	a) Both A and B are true, and B is the	b) Both A and B are true, but B is	c) A is true, but B is false	d) A is false, but B is true	a

	correct explanation of A	not the correct explanation of A			
100	For horizontal flow in a saturated aquifer, the product of hydraulic conductivity and thickness is equal to _____. (Choose Correct option to fill in the blank)				transmissivity
	a) specific yield	b) transmissivity	c) coefficient of storage	d) seepage force	b
101	In which crystal system the mineral anorthite commonly crystallizes?				Triclinic
	a) Isometric	b) Tetragonal	c) Monoclinic	d) Triclinic	(d)
102	Match the mineral groups with their silicate structures. A. Feldspar — i. Nesosilicate B. Mica — ii. Tectosilicate C. Garnet — iii. Inosilicate D. Pyroxene — iv. Phyllosilicate				A-ii, B-iv, C-i, D-iii
	a) A-ii, B-iv, C-i, D-iii	b) A-ii, B-iv, C-iii, D-i	c) A-ii, B-i, C-iv, D-iii	d) A-iv, B-iii, C-ii, D-i	(a)
103	Find the false statements about flint. A. Flint is a microcrystalline variety of silica. B. It is a hydrous silicate mineral. C. It forms from the crystallization of magma in plutonic conditions. D. Flint has been used as stone weapon.				B and C only
	a) A and B only	b) B and C only	c) A and D only	d) B and D only	(b)
104	For the following Assertion (A) and Justification (B), choose the correct option. **A**: Kyanite is the densest polymorph of aluminosilicate mineral. **B**: Kyanite is stable under high pressure due to which the molar volume is smaller than other polymorphs.				Both A and B are correct. B is the correct justification for A.
	a) Both A and B are correct. B is the correct justification for A.	b) A is correct. B is incorrect.	c) A is incorrect. B is correct.	d) Both A and B are incorrect.	(a)
105	Which instrument uses non-destructive technique for analysing chemical composition of minerals?				Electron probe microanalyzer
	a) Thermal ionization mass spectrometry	b) X-ray diffractometer	c) Laser-ablation ICP-MS	d) Electron probe microanalyzer	(d)
106	In which form do kimberlites usually occur?				Pipe
	a) Pipe	b) Tabular	c) Batholith	d) Large Igneous Province	(a)

<table>
<tr><td>107</td><td colspan="4">Match the given igneous rocks to their major minerals.
<table><tr><td>A. Granite</td><td>i. Plagioclase + pyroxene</td></tr><tr><td>B. Basalt</td><td>ii. Olivine + garnet + chromite</td></tr><tr><td>C. Kimberlite</td><td>iii. Olivine + pyroxene + Spinel</td></tr><tr><td>D. Komatiite</td><td>iv. Feldspar + quartz</td></tr></table></td><td>A-iv, B-i, C-ii, D-iii</td></tr>
<tr><td></td><td>a) A-iv, B-i, C-ii, D-iii</td><td>b) A-iv, B-ii, C-i, D-iii</td><td>c) A-iv, B-iii, C-ii, D-i</td><td>d) A-i, B-ii, C-iii, D-iv</td><td>(a)</td></tr>
<tr><td>108</td><td colspan="4">Which of the statements are false?

A. Denser magmas always reach surface of the earth and solidifies.
B. Deeper the magma is generated, the chances of erupting on the earth’s surface are more.
C. Earth’s crust acts as density filter.
D. Kimberlitic magmas are generated in lower crust.</td><td>A and D only</td></tr>
<tr><td></td><td>a) A and C only</td><td>b) B and C only</td><td>c) A and D only</td><td>d) A and B only</td><td>(c)</td></tr>
<tr><td>109</td><td colspan="4">For the following Assertion (A) and Justification (B), choose the correct option.

A: Mantle plume originates at the core-mantle boundary (CMB) from the regions having low heat flux compared to average CMB heat flux.

B: Heat transfer mechanism from the core to the base of the mantle is primarily by convection.</td><td>A is correct. B is incorrect.</td></tr>
<tr><td></td><td>a) Both A and B are correct. B is the correct justification for A.</td><td>b) A is correct. B is incorrect.</td><td>c) A is incorrect. B is correct.</td><td>d) Both A and B are incorrect.</td><td>(b)</td></tr>
<tr><td>110</td><td colspan="4">Which one of the following igneous textures is an indication of eutectic crystallization?</td><td>graphic texture</td></tr>
<tr><td></td><td>a) Porphyritic texture</td><td>b) Poikilitic texture</td><td>c) Orbicular texture</td><td>d) Graphic texture</td><td>(d)</td></tr>
<tr><td>111</td><td colspan="4">Which one of the following rocks is an example of contact metamorphism?</td><td>Skarn</td></tr>
<tr><td></td><td>a) Biotite gneiss</td><td>b) Skarn</td><td>c) Schist</td><td>d) Quartzite</td><td>(b)</td></tr>
<tr><td>112</td><td colspan="4">Match the metamorphic facies to their typical mafic mineral assemblage.
<table><tr><td>A. Zeolite facies</td><td>i. Omphacite + pyrope</td></tr><tr><td>B. Amphibolite facies</td><td>ii. Orthopyroxene + augite</td></tr><tr><td>C. Granulite facies</td><td>iii. Hornblende</td></tr><tr><td>D. Eclogite facies</td><td>iv. Chlorite</td></tr></table></td><td>A-iv, B-iii, C-ii, D-i</td></tr>
</table>

<table>
<tr><td></td><td>a) A-ii, B-i, C-iv, D-iii</td><td>b) A-i, B-ii, C-iii, D-iv</td><td>c) A-iii, B-ii, C-iv, D-i</td><td>d) A-iv, B-iii, C-ii, D-i</td><td>(d)</td></tr>
<tr><td>113</td><td colspan="4">Which one of the following orders of metamorphic zones is observed in Dalradian region of Barrovian zone?

A. Chlorite zone - Biotite zone - Garnet zone - Kyanite zone - Sillimanite zone.
B. Chlorite zone - Biotite zone - Garnet zone - Staurolite zone - Sillimanite zone.
C. Biotite zone - Kyanite zone - Sillimanite zone - Garnet zone.
D. Chlorite zone - Biotite zone - Epidote zone - Andalusite zone - Sillimanite zone.</td><td>A only</td></tr>
<tr><td></td><td>a) A only</td><td>b) A and B only</td><td>c) B and C only</td><td>d) D only</td><td>(a)</td></tr>
<tr><td>114</td><td colspan="4">For the following Assertion (A) and Justification (B), choose the correct option.

A: Metamorphic terrain can reflect two different types of metamorphic facies series in adjacent areas.

B: Facies series does not represent the actual P-T path followed by the rocks.</td><td>Both A and B are true, and B is the correct explanation</td></tr>
<tr><td></td><td>a) Both A and B are true, and B is the correct explanation</td><td>b) Both A and B are true, but B is not the correct explanation</td><td>c) A is True but B is false</td><td>d) Both A and B are false</td><td>(a)</td></tr>
<tr><td>115</td><td colspan="4">Which one of the following pairs is used as geothermometer?</td><td>Grt-Cpx</td></tr>
<tr><td></td><td>a) Qtz-Plg</td><td>b) Grt-Qtz</td><td>c) Grt-Cpx</td><td>d) Cal-Bt</td><td>(c)</td></tr>
<tr><td>116</td><td colspan="4">The smaller valve of brachiopod shell is known as _____.</td><td>brachial valve</td></tr>
<tr><td></td><td>a) brachial valve</td><td>b) pedicle valve</td><td>c) lophophore</td><td>d) ventral valve</td><td>(a)</td></tr>
<tr><td>117</td><td colspan="4">Match the suture types of cephalopods to their characters.

<table><tr><td>A. Nautiloid type</td><td>i. Simple straight or undulating</td></tr><tr><td>B. Ammonoid type</td><td>ii. Rounded saddles and angular lobes</td></tr><tr><td>C. Ceratite type</td><td>iii. Highly divided saddles and lobes</td></tr><tr><td>D. Goniatite type</td><td>iv. Smooth rounded saddles and finely divided lobes</td></tr></table></td><td>A-i, B-iii, C-iv, D-ii</td></tr>
<tr><td></td><td>a) A-ii, B-i, C-iv, D-iii</td><td>b) A-iv, B-iii, C-ii, D-i</td><td>c) A-i, B-iii, C-iv, D-ii</td><td>d) A-i, B-iv, C-ii, D-iii</td><td>(c)</td></tr>
<tr><td>118</td><td colspan="4">Find the true statements about the evolution of horses.

A. Horses are odd toed ungulates.
B. Eohippus is the earliest known fossil of horses.
C. The genus Mesohippus is restricted to Oligocene.
D. Siwalik rocks preserved fossils of the genus Hipparion.</td><td>All are true</td></tr>
</table>

	a) A and B only	b) A, B and c only	c) B and D only	d) All are true	(d)
119	For the following Assertion (A) and Justification (B), choose the correct option. **A**: Derived fossils are older than the rocks in which they are found. **B**: Derived fossils are transported from older lithounit and redeposited.				Both A and B are true, and B is the correct explanation
	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	(a)
120	What is the characteristic of schizodont dentition?				few and strong teeth diverge from the umbo
	a) numerous small teeth	b) absence of true teeth and socket	c) few teeth at the centre of ligament pit	d) few and strong teeth diverge from the umbo	(d)
121	Oceanic conveyor belt refers to ____.				thermohaline circulation
	a) wind-driven circulation	b) Ekman circulation	c) thermohaline circulation	d) geostrophic circulation	(c)
122	Match the oceans with their average depths (in metres). A. Indian Ocean — i. 3646 B. Pacific Ocean — ii. 3741 C. Atlantic Ocean — iii. 3270 D. Southern Ocean — iv. 4280				A-ii, B-iv, C-i, D-iii
	a) A-iii, B-iv, C-i, D-ii	b) A-ii, B-iv, C-i, D-iii	c) A-ii, B-i, C-iv, D-iii	d) A-iv, B-iii, C-ii, D-i	(b)
123	Find the false statement(s). A. Hydrothermal vents are opening in continental shelf regions through which gasses are ejected. B. Underlying magmas provide heat sources for the fluids. C. Black smokers are examples of hydrothermal vents. D. Black smokers eject silicon, barium and aluminium rich fluids.				A and D only
	a) A only	b) A and D only	c) B and C only	d) A, C and D only	(b)
124	For the following Assertion (A) and Justification (B), choose the correct option. **A**: Calcareous oozes are not found below the depth of calcium carbonate compensation depth (CCD).				Both A and B are true, and B is the

	B: Below the depth of CCD, the shells of calcareous oozes dissolve.				correct explanation
	a) Both A and B are true, and B is the correct explanation	b) Both A and B are true, but B is not the correct explanation	c) A is True but B is false	d) Both A and B are false	(a)
125	Where in the world oceans is the biological productivity maximum?				Eastern equatorial Pacific Ocean
	a) Eastern equatorial Indian Ocean	b) Western equatorial Atlantic Ocean	c) Eastern equatorial Pacific Ocean	d) Western equatorial Indian Ocean	(c)
126	Which naturally occurring isotope of uranium has highest half-life duration?				^{238}U
	a) ^{234}U	b) ^{235}U	c) ^{236}U	d) ^{238}U	(d)
127	Match the minerals and the commonly used isotopic method of dating them. A. Biotite – i. U-Pb B. Zircon – ii. Sm-Nd C. Garnet – iii. Rb-Sr				A-iii, B-i, C-ii
	a) A-iii, B-i, C-ii	b) A-i, B-ii, C-iii	c) A-ii, B-iii, C-i	d) A-iii, B-ii, C-i	(a)
128	Find the false statements. A. Phase diagrams are usually constructed using P-T-X coordinates. B. Phase diagrams yield information about structure of minerals. C. Different mineral phases marked within the fields are stable at given pressure-temperature range. D. Invariant point represents the stability of more than two phases.				B only
	a) A and D only	b) B and C only	c) B only	d) D only	(c)
129	For the following Assertion (A) and Justification (B), choose the correct option. **A**: Precipitation is the major source for groundwater recharge in temperate and humid regions. **B**: In temperate and humid climates, stable isotope composition of groundwater is similar to that of the precipitation in the area of recharge.				Both A and B are correct. B is the correct justification for A.
	a) Both A and B are correct. B is the correct justification for A.	b) A is correct. B is incorrect.	c) A is incorrect. B is correct.	d) Both A and B are incorrect.	(a)
130	What type of EMR is used in EPMA for analyzing geologic materials?				X-rays
	a) Ultraviolet	b) Infrared	c) X-rays	d) Radio waves	(c)
131	What mineral is precipitated from black smokers?				Pyrrhotite
	a) Pyrite	b) Pyrrhotite	c) Sphalerite	d) Galena	(b)

<table>
<tr><td>132</td><td colspan="4">Match the elements to their naturally occurring ore minerals.

<table><tr><td>A. Tungsten</td><td>i. Pitchblende</td></tr><tr><td>B. Lithium</td><td>ii. Galena</td></tr><tr><td>C. Zinc</td><td>iii. Spodumene</td></tr><tr><td>D. Uranium</td><td>iv. Wolframite</td></tr></table></td><td>A-iv, B-iii, C-ii, D-i</td></tr>
<tr><td></td><td>a) A-i, B-iii, C-ii, D-iv</td><td>b) A-iii, B-i, C-ii, D-iv</td><td>c) A-iv, B-ii, C-iv, D-iii</td><td>d) A-iv, B-iii, C-ii, D-i</td><td>(d)</td></tr>
<tr><td>133</td><td colspan="4">Find the false statement(s).

A. Chromite deposits occur as stratiform and podifom bodies.
B. Podiform deposits are geologically older, mostly restricted in Proterozoic.
C. Podiform deposits form large chromite deposit than stratiform deposits.
D. Sukinda chromite is an example of podiform chromite deposit.</td><td>B and C only</td></tr>
<tr><td></td><td>a) A and D only</td><td>b) A and B only</td><td>c) B and C only</td><td>d) B and D only</td><td>(c)</td></tr>
<tr><td>134</td><td colspan="4">For the following Assertion (A) and Justification (B), choose the correct option.

A: Economic deposits of ilmenite and rutile occur as placer deposits.

B: Minerals such as ilmenite and rutile have low specific gravity hence concentrated in beach sands.</td><td>A is correct. B is incorrect.</td></tr>
<tr><td></td><td>a) Both A and B are correct. B is the correct justification for A.</td><td>b) A is correct. B is incorrect.</td><td>c) A is incorrect. B is correct.</td><td>d) Both A and B are incorrect.</td><td>(b)</td></tr>
<tr><td>135</td><td colspan="4">What is the general range of salinity of Type III primary fluid inclusions?</td><td>>50%</td></tr>
<tr><td></td><td>a) <10%</td><td>b) 10-23%</td><td>c) 30-40%</td><td>d) >50%</td><td>(d)</td></tr>
<tr><td>136</td><td colspan="4">How does gold deposit occur in Kolar Gold Fields?</td><td>Lode gold</td></tr>
<tr><td></td><td>a) Lode gold</td><td>b) Placer gold</td><td>c) Stratiform gold</td><td>d) Stratabound gold</td><td>(a)</td></tr>
<tr><td>137</td><td colspan="4">Match the deposits and their place of occurrence.

<table><tr><td>A. Zawar</td><td>i. Thorium</td></tr><tr><td>B. Kudremukh</td><td>ii. Uranium</td></tr><tr><td>C. Tummalapalle</td><td>iii. Lead-zinc</td></tr><tr><td>D. Manavalakurichi</td><td>iv. Iron</td></tr></table></td><td>A-iii, B-iv, C-ii, D-i</td></tr>
<tr><td></td><td>a) A-ii, B-i, C-iv, D-iii</td><td>b) A-iii, B-iv, C-ii, D-i</td><td>c) A-i, B-iii, C-iv, D-i</td><td>d) A-iv, B-iii, C-ii, D-i</td><td>(b)</td></tr>
<tr><td>138</td><td colspan="4">Find the true statement(s).

A. Mangampeta barite deposit is the world’s largest single bedded barite deposit.
B. It is found within Vindhyan basin.
C. The deposit is Triassic in age.</td><td>A and D only</td></tr>
</table>

	D. The total estimated reserve is 74 million tonnes.				
	a) A only	b) A and B only	c) A and D only	d) B and C only	(c)
139	For the following Assertion (A) and Justification (B), choose the correct option. **A**: Wollastonite is found in skarn deposits. **B**: Skarn deposits form primarily by the intrusion into carbonate/argillaceous rocks.				Both A and B are correct.
	a) Both A and B are correct.	b) A is correct. B is incorrect.	c) A is incorrect. B is correct.	d) Both A and B are incorrect.	(a)
140	Petroleum in Digboi Oil Field is trapped in ____.				anticline
	a) syncline	b) anticline	c) basin	d) unconformity	(b)
141	What is the age of oil producing formations in Digboi Oil Field?				Neogene
	a) Jurassic	b) Cretaceous	c) Palaeogene	d) Neogene	(d)
142	Match the coal deposits to their ages. A. Neyveli lignite — i. Permian B. Raniganj coal — ii. Eocene-Miocene C. Makum coal — iii. Miocene-Pliocene				A-iii, B-ii, C-i
	a) A-i, B-ii, C-iii	b) A-ii, B-iii, C-i	c) A-ii, B-i, C-iii	d) A-iii, B-ii, C-i	(d)
143	Find the false statements about coal lithotypes. A. Vitrain is black and dull. B. Clarain is bright with earthy lustre. C. Durain is black with vitreous lustre. D. Fusain is grey, hard and vitreous lustre.				All are false.
	a) A and B only	b) A and C only	c) All are correct.	d) All are false.	(d)
144	For the following Assertion (A) and Justification (B), choose the correct option. **A**: Anthracite coal contains low H/C ratio. **B**: Anthracite coal forms during the graphitization stage which is the highest stage of coalification.				Both A and B are correct. B is the correct explanation for A.
	a) Both A and B are correct. B is the correct explanation for A.	b) A is correct. B is incorrect.	c) A is incorrect. B is correct.	d) Both A and B are incorrect.	(a)

<table>
<tr><td>145</td><td colspan="4">What is the composition of microlithotype liptite?</td><td>Exinite >95%</td></tr>
<tr><td></td><td>a) Vitrinite >95%</td><td>b) Intertinite >95%</td><td>c) Exinite >95%</td><td>d) Vitrinite and intertinite >95%</td><td>(c)</td></tr>
<tr><td>146</td><td colspan="4">What is the oldest known lithounit in Dharwar craton?</td><td>Gorur Gneiss</td></tr>
<tr><td></td><td>a) Gorur Gneiss</td><td>b) Sukma Gneiss</td><td>c) Older Metamorphic Gneiss</td><td>d) Peninsular Gneiss</td><td>(a)</td></tr>
<tr><td>147</td><td colspan="4">Match the formations to their Proterozoic basins where they occur.
<table><tr><td>A. Pullampet Formation</td><td>i. Khariar basin</td></tr><tr><td>B. Panna Shale</td><td>ii. Vindhyan basin</td></tr><tr><td>C. Saraipali Shale</td><td>iii. Cuddapah basin</td></tr><tr><td>D. Neor Sandstone</td><td>iv. Chhattisgarh basin</td></tr></table></td><td>A-iii, B-ii, C-iv, D-i</td></tr>
<tr><td></td><td>a) A-i, B-ii, C-iii, D-iv</td><td>b) A-iii, B-ii, C-iv, D-i</td><td>c) A-ii, B-iii, C-i, D-iv</td><td>d) A-iv, B-iii, C-ii, D-i</td><td>(b)</td></tr>
<tr><td>148</td><td colspan="4">Find the false statements about the Cuddapah basin.

A. Cuddapah basin is developed over Archaean Bastar craton.
B. Gulcheru Quartzite is the lower most formation of Cuddapah basin.
C. Western part of the basin is more deformed than the eastern part.
D. The world class Zawar Pb-Zn deposit is hosted within Cuddapah basin.</td><td>A, C and D only</td></tr>
<tr><td></td><td>a) A and C only</td><td>b) A, B and C only</td><td>c) A, C and D only</td><td>d) All are false.</td><td>(c)</td></tr>
<tr><td>149</td><td colspan="4">For the following Assertion (A) and Justification (B), choose the correct option.

A: Exposed area of Bundhelkhand craton is about 26,000 sq. km.

B: Considerable area of the craton is covered with thick Brahmaputra alluvium.</td><td>A is correct. B is incorrect.</td></tr>
<tr><td></td><td>a) Both A and B are correct. B is the correct justification for A.</td><td>b) Both A and B are correct. B is not the correct justification for A.</td><td>c) A is correct. B is incorrect.</td><td>d) Both A and B are incorrect.</td><td>(c)</td></tr>
<tr><td>150</td><td colspan="4">What is the time period of Great Oxidation Event in Earth’s history?</td><td>2.4 to 2.2 Ga</td></tr>
<tr><td></td><td>a) 2.6 to 2.4 Ga</td><td>b) 2.4 to 2.2 Ga</td><td>c) 2.2 to 2.0 Ga</td><td>d) 2.0 to 1.8 Ga</td><td>(b)</td></tr>
</table>