

Test Booklet No. \_\_\_\_\_

**This booklet consists of 150 questions and 21 printed pages.**

**RGUPET/2024/\_\_\_/\_\_\_**

**RGUPET 2024**  
**Common Entrance Test, 2024**  
**DOCTOR OF PHILOSOPHY IN GEOLOGY**

**Full Marks: 150**  
**Hours**

**Time: 3**

Roll No.

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Day and Date of Examination: \_\_\_\_\_

Signature of Invigilator(s) \_\_\_\_\_

Signature of Candidate \_\_\_\_\_

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*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 within two hour.
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	'One who possesses many talents'. What is the one word substitute for the given statement?				Answer option (c)
	a) Exceptional	b) Wisdom	c) Versatile	d) Nubile	Versatile
2	Change the speech of the given sentence: <i>He said to me, "I am writing now".</i>				Answer option (a)
	a) He told me that he was writing then.	b) He said me that he is writing.	c) He told me that he was writing.	d) He told that he is writing.	He told me that he was writing then.
3	Which of the following sentences is correctly punctuated? A. Everyone has special skills; some people use them very well. B. Everyone has special skills; and, some people use them very well. C. Everyone has special skills some people use them very well. D. Everyone has special skills and, some people use them very well.				Answer option (a)
	a) A only	b) B only	c) C only	d) D only	A only
4	Given below are the two statements. One is labelled as assertion and another as justification.  A: Assertion: I do not know where he has gone.  B: Justification: The above sentence is a compound sentence in which sentences are combined by conjunctions.				Answer option (b)
	a) Both A and B are correct and B is the correct explanation for A.	b) A is correct and B is not the correct explanation for A.	c) A is incorrect and B is the correct explanation for A.	d) A is incorrect and B is not the correct explanation for A.	A is correct and B is not the correct explanation for A.
5	Match the synonyms.				Answer option (c)
	A. Acclaim		i. gracious		
	B. Benign		ii. boy		
	C. Citadel		iii. applaud		
	D. Lad		iv. fortress		
	a) A-ii, B-iv, C-i, D-iii	b) A-iv, B-iii, C-ii, D-i	c) A-iii, B-i, C-iv, D-ii	d) A-iii, B-ii, C-i, D-iv	A-iii, B-i, C-iv, D-ii
6	Who discovered radioactivity?				Answer option (c)
	a) Newton	b) Thomas Edison	c) Henry Becquerel	d) Mary Curie	Henry Becquerel
7	What is the longest running talk show in television in the world?				Answer option (b)
	a) Remembrance Sunday	b) Tonight Show	c) Blue Peter	d) Doctor Who	Tonight Show
8	Which of the following statements are <b>true</b> ?  A. Arunachal Pradesh was declared as state in the year 1987. B. It shares around 1500 kilometer disputed boundary with China. C. Currently the state has 21 districts. D. Mr. Prem Khandu Thungan was the first chief minister of Arunachal Pradesh.				Answer option (d)

	a) A, B and C are correct.	b) A, C and D are correct.	c) C and D are correct.	d) A and D are correct.	A and D are correct.								
9	<p>Given below are the two statements. One is labelled as assertion and another as justification.</p> <p>A: Assertion: Polio virus attacks nervous systems and can lead to spinal and respiratory paralysis.</p> <p>B: Justification: The first successful vaccine for polio was created by Jonas Salk.</p>				Answer option (a)								
	a) Both A and B are correct.	b) Both A and B are incorrect.	c) A is correct and B is incorrect.	d) A is incorrect and B is correct.	Both A and B are correct.								
10	<p>Match the sports and the players.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">A. Cricket</td> <td style="width: 50%;">i. Dhyan Chand</td> </tr> <tr> <td>B. Football</td> <td>ii. Sachin Tendulkar</td> </tr> <tr> <td>C. Tennis</td> <td>iii. Sunil Chhetri</td> </tr> <tr> <td>D. Hockey</td> <td>iv. Roger Federer</td> </tr> </table>				A. Cricket	i. Dhyan Chand	B. Football	ii. Sachin Tendulkar	C. Tennis	iii. Sunil Chhetri	D. Hockey	iv. Roger Federer	Answer option (a)
A. Cricket	i. Dhyan Chand												
B. Football	ii. Sachin Tendulkar												
C. Tennis	iii. Sunil Chhetri												
D. Hockey	iv. Roger Federer												
	a) A-ii, B-iii, C-iv, D-i	b) A-iii, B-ii, C-iv, D-i	c) A-ii, B-iii, C-i, D-iv	d) A-iv, B-i, C-ii, D-iii	A-ii, B-iii, C-iv, D-i								
11	Which country is set to host the 9 <sup>th</sup> ICC Women's T20 World Cup 2024?				b								
	a) Australia	b) Bangladesh	c) England	d) New Zealand	Bangladesh								
12	Recently fossil of largest known madtsoiid snake, ' <i>Vasuki indicus</i> ' was found in which state of India?				c								
	a) Rajasthan	b) Maharashtra	c) Gujrat	d) Madhya Pradesh	Gujrat								
13	<p>'Goldman Environmental Prize' was won by following Indians. Choose the correct options?</p> <p>A. Alok Shukla in 2024  B. Licypriya Kangujam in 2017  C. Medha Patkar in 1992  D. Maneka Gandhi in 1990</p>				b								
	a) A&B	b) A&C	c) C&D	d) B&C	A&C								
14	<p>For the following Assertions (A) and Justification (B), choose the correct alternative from the following options:</p> <p>A: On 3<sup>rd</sup> April 2024 'Agni Prime' or 'Agni-P' was successfully flight-tested from Dr APJ Abdul Kalam Island off Odisha coast.</p> <p>B: It is a nuclear-capable new-generation advanced variant of the Agni class of missiles.</p>				d								
	a) A is true but B is false	b) Both A and B are false	c) Both A and B are true and B is the correct justification for A	d) Both A and B are true and B is not the correct justification for A	Both A and B are true and B is not the correct justification for A								

15	Match the following pairs of government schemes and their purposes:				
	A. PM-DAKSH scheme	i.To eliminate the hazardous practice of manual sewer and septic tank cleaning			d
	B. PM-SURAJ scheme	ii. A National Action Plan for skilling marginalized persons covering SCs, OBCs, EBCs, DNTs, Sanitation workers including waste pickers			
	C. PRITHVI scheme	iii. A comprehensive initiative aimed at bolstering research across various domains of Earth sciences			
	D. NAMASTE scheme	iv. To uplift the most marginalized sections of society and provide credit assistance to one lakh entrepreneurs from disadvantaged communities			
	a) A-i, B-ii, C-iii, D-iv	b) A-ii, B-iii, C-iv, D-i	c) A-iv, B-iii, C-ii, D-i	d) -ii, B-iv, C-iii, D-i	A-ii, B-iv, C-iii, D-i
16	If the sum of three consecutive positive integers is equal to their product, then what is the sum of their squares?				a
	a) 14	b) 16	c) 25	d) 29	14
17	If the deviations are taken from mean, then the arithmetic mean of the squared deviation is known as _____. (Fil in the blank)				c
	a)mean deviation	b)standard deviation	c)variance	d)kurtosis	variance
18	Consider the following statements and choose the correct statement(s).  A. Diagonals of rhombus are always equal in length. B. Diagonals of rhombus are always perpendicular to each other. C. Diagonals of rectangles are always equal in length. D. Diagonals of rectangles are always perpendicular to each other.				b
	a) A & B	b) B & C	c) A & D	d) A, B & D	B & C
19	For the following Assertion (A) and Justification (B), choose the correct option.  A: For effective classroom communication, at times it is desirable to use the projection technology.  B: Using the projection technology facilitates extensive coverage of course contents.				b

	a)Both A and B are true, and B is the correct explanation	b)Both A and B are true, butB is not the correct explanation	c) A is True but B is false	d) Both A and B are false	Both A and B are true, butB is not the correct explanation
20	<p>The following pie chart represents the break-up of monthly expenditure of Mr. X. If he spent Rs. 3000 more on food and transport together than he spent on rent, then what is his total monthly expenditure.</p> <p>The pie chart shows the following distribution of monthly expenditure: Others (35%), Transport (8%), Food (22%), Rent (15%), and Education (20%).</p>				d
	a) Rs. 15000	b) Rs. 20000	c) Rs. 30000	d) Rs. 40000	Rs. 40000
21	One of the essential characteristics of research is _____.				Answer option (d)
	a) replicability	b) generalizability	c) usability	d) objectivity	objectivity
22	The state 'honesty is the best policy' is _____.				Answer option (b)
	a) a fact	b) a value	c) an opinion	d) a value judgement	a value
23	<p>Which of the following statements are <b>true</b> in case of research design?</p> <p>A. Every research needs its respective research design.  B. Research design does not depend on the skills of researcher.  C. Availability of time and money influences research design.  D. Objective of research also controls research design.</p>				Answer option (c)
	a) A and D only	b) B and C only	c) A, C and D only	d) B, C and D only	A, C and D only
24	<p>Given below are the two statements. One is labelled as assertion and another as justification.</p> <p>A: Assertion: Research in geosciences is always qualitative.  B: Justification: Geoscientific research does not require quantitative measurements.</p>				Answer option (d)
	a) Both A and B are correct.	b) A is correct and B is incorrect.	c) A is incorrect and B is correct.	d) Both A and B are incorrect.	Both A and B are incorrect.
25	Match the following pairs.				Answer option (a)

	A. Principle of Replication	i. Extraneous factors made to vary deliberately.			
	B. Principle of Randomization	ii. Selecting items for research			
	C. Principle of Local Control	iii. Variations by extraneous factors grouped as “chance”.			
	D. Sample design	iv. Experiments are repeated.			
	a) A-iv, B-iii, C-i, D-ii	b) A-iii, B-i, C-iv, D-ii	c) A-i, B-iv, C-ii, D-iii	d) A-iii, B-iv, C-i, D-ii	A-iv, B-iii, C-i, D-ii
26	A hypothesis can be stated as _____.				Answer option (c)
	a)statement of fact	b)supposition based on the past experience	c)tentative statement whose validity is still to be tested	d)all the above	tentative statement whose validity is still to be tested
27	Which of the following statements are <b>true</b> in case of exploratory research studies?  A. Overall research design shall be flexible. B. Requires non-probability sampling design. C. Requires pre-planned design for analysis. D. Requires structured instruments for collection of data.				Answer option (a)
	a)A and B only	b) A and C only	c)A and D only	d)C and D only	A and B only
28	Synopsis of a research work is _____.				Answer option (a)
	a)summary of findings of the research	b)work plan of research	c)combination of objective and methodology	d)summary of previous works	summary of findings of the research
29	Nominal data represents _____.				Answer option (a)
	a) numerical in name only	b) inequalities	c) differences	d) quotients	numerical in name only
30	Which of the statements is/are <b>true</b> in case of questionnaire?  A. it is relatively cheap. B. response is high. C. generated data are always true. D. cannot be used with illiterate people.				Answer option (c)
	a) A and B only	b) A, B and C only	c) A and D only	d) B and C only	A and D only
31	Scaling describes the procedures of assigning _____.				Answer option (a)
	a) numbers to various degrees of opinion etc.	b) ratios to various degrees of opinion etc.	c) names to various degrees of opinion etc.	d) none of the above	numbers to various degrees of opinion etc.
32	Match the type of scale of with corresponding description.				Answer option (c)
	A. Nominal scale		i. true zero of measurement		

	B. Ordinal scale	ii. separating units on the basis of units			
	C. Interval scale	iii. assigning numbers, not in order			
	D. Ratio scale	iv. Lowest level of ordered scale			
	a)A-i, B-ii, C-iii, D-iv	b)A-ii, B-iii, C-iv, D-i	c) A-iii, B-iv, C-ii, D-i	d) A-iv, B-iii, C-ii, D-i	A-iii, B-iv, C-ii, D-i
33	The data that was collected by a researcher for the first time is known as _____.				Answer option (a)
	a) primary data	b) secondary data	c) tertiary data	d)exponential data	primary data
34	In case of sample design, universe refers to _____.				Answer option (c)
	a) geographical area	b) number of items	c) defining objects	d) specific population parameters	defining objects
35	What percentage of total area under Normal curve lie within $\pm 2\sigma$ ?				b
	a) 68.26	b) 95.44	c) 99.00	d) 99.73	95.44
36	Which of the following statements about kurtosis is true? A. Evenly distributed frequency represents platycurtic curve. B. Evenly distributed frequency represents leptokurtic curve. C. Evenly distributed frequency represents mesokurtic curve. D. Laptokurtic curves are always asymmetrical.				a
	a) A	b) B	c) C	d) D	A
37	The value of a variable that divides a series in such a way that 25% of the observations are greater is known as _____. (Fill in the blank)				c
	a) First Quartile	b) Second Quartile	c) Third Quartile	d) Median	Third Quartile
38	Which of the following is not a measure of deviation?				b
	a) Coefficient of standard deviation	b) Coefficient of regression	c) Coefficient of range	d) Semi-interquartile range	Coefficient of regression
39	If a frequency distribution is positively skewed then which of the following relation is correct?				c
	a) Mode>Mean	b) Mode=Median	c) Mode<Median	d) Mean<Median	Mode<Median
40	If AM is arithmetic mean, GM is geometric mean and HM is harmonic mean, then which of the following statement is always true?				d
	a) AM=GM=HM	b) AM $\neq$ GM $\neq$ HM	c) AM>GM>HM	d) AM $\geq$ GM $\geq$ HM	AM $\geq$ GM $\geq$ HM
41	Which section of uniaxial mineral shows perfect interference figure?				a
	a) Basal section	b) Any section	c) Section parallel to optic axis	d) Section parallel to c-axis	Basal section

42	Minimum how many apparent dip measures are required to obtain the attitude of a planar structure?				b
	a) One	b) Two	c) Three	d) Four	Two
43	Which of the following statements are true for dykes? A. They are concordant igneous bodies. B. They are discordant igneous bodies. C. They are tabular igneous bodies. D. They are always vertical.				d
	a) A&B	b)A&C	c) C&D	d)B&C	B&C
44	For the following Assertion (A) and Justification (B), choose the correct option. A: Geological fieldwork is an integral part of the geoscientific research. B: One needs to collect samples during fieldwork.				b
	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.	Both A and B are true, but B is not the correct explanation.
45	Match the following pairs of minerals and their interference colours.				c
	A. Quartz		i. Higher order variegated		
	B. Orthoclase		ii. Second order green		
	C. Hornblende		iii. First order yellow		
	D. Calcite		iv. First order grey		
	a) A-i, B-ii, C-iii, D-iv	b) A-ii, B-iv, C-i, D-iii	c) A-iii, B-iv, C-ii, D-i	d) A-iv, B-i, C-ii, D-iii	A-iii, B-iv, C-ii, D-i
46	Which of the following methods can be used to study active tectonics?				d
	a) Geomorphological mapping	b) Seismotectonic studies	c) Palaeoseismic studies	d) All of the above	All of the above
47	Which of the following describes the number of articles for which an author has been cited by other authors at least that same number of times?				c
	a) CiteScore	b) i10 index	c) h-index	d) g-index	h-index
48	Which of the following is a free plagiarism checker?				d
	a) Ouriginal	b) Turnitin	c) DrillBit	d) DupliChecker	DupliChecker
49	Which of the following statements is/are true about peer review process? A. It helps to maintain the quality of articles published. B. The identity of reviewer may not be disclosed to the author. C. One of the authors may be the reviewer of the article.				b



	D. The reviewer is always biased.				
	a) A only	b) A&B	c) C only	d) C&D	A&B
50	Which of the following measures indicate the sorting of sediments? A. Mean B. Skewness C. Kurtosis D. Standard Deviation				c
	a) A&B	b) B&C	c) C&D	d) A&D	C&D
51	In olivine group of minerals, which one of the following increases with increase in fayalite content?				Answer option (b)
	a) Hardness	b) Unit cell volume	c) Twinning	d) Melting point	Unit cell volume
52	On heating a smectite clay mineral, its basal spacing crystal structure reduces. This would cause X-ray diffraction peak corresponding to the basal layer to _____.				Answer option (c)
	a) increase in intensity	b) decrease in intensity	c) shift towards the higher $2\theta$ value	d) shift towards the smaller $2\theta$ value	shift towards the higher $2\theta$ value
53	Which of the following statements is/are <b>true</b> ? A. Polymorphs of a chemical compound having different structures. B. Polymorphs would have similar physical properties. C. Polymorphs cannot be produced by displacing atoms within the structure. D. Polyttypism is special kind of polymorphism.				Answer option (c)
	a) A and B only	b) A and C only	c) A and D only	d) A, C and D only	A and D only
54	Given below are the two statements. One is labelled as <b>assertion</b> and another as <b>justification</b> . <b>A: Assertion:</b> b-axis length of amphibole is nearly twice the length of the pyroxene. <b>B: Justification:</b> Due to double chain silicate structure, the b-axis length is doubled in amphiboles than in pyroxene.				Answer option (c)
	a) A is correct and B is incorrect.	b) A is incorrect and B is correct.	c) Both A and B are correct. B is the correct explanation for A.	d) Both A and B are incorrect.	Both A and B are correct. B is the correct explanation for A.
55	Match the following.				Answer option (a)
	<b>Point Group</b>		<b>Crystal System</b>		
	A. $4/m\bar{3}2/m$		i. Monoclinic		
	B. $2/m2/m2/m$		ii. Isometric		
	C. $4/m2/m2/m$		iii. Orthorhombic		
	D. $2/m$		iv. Tetragonal		
	a) A-ii, B-iii, C-iv, D-i	b) A-iv, B-iii, C-ii, D-i	c) A-i, B-iii, C-iv, D-ii	d) A-iv, B-iii, C-ii, D-i	A-ii, B-iii, C-iv, D-i

56	What is the pattern of stacking of atomic planes in hexagonal closest packing?				Answer option (a)
	a)ababab	b)abcabc	c)aababc	d)abcabb	ababab
57	Which of the following statements is/are <b>true</b> ? <b>A.</b> Barrovian zone of metamorphism represents medium P/T condition. <b>B.</b> Parallel metamorphic belts exhibit different P/T conditions of metamorphism. <b>C.</b> The Himalayas exhibit inverted metamorphism. <b>D.</b> Isograds are marked based on the change in the texture of metamorphic rocks.				Answer option (c)
	a)A only	b) A and B only	c) A, B and C only	d) A, C and D only	A, B and C only
58	Cumulate texture results due to _____.				Answer option (d)
	a) partial melting	b) eutectic crystallization	c) filter pressing	d) gravity settling	gravity settling
59	Match the minerals with their crystal systems.				Answer option (c)
	<b>Mineral</b>		<b>Cystal system</b>		
	A. Sanidine		i. Orthorhombic		
	B. Microcline		ii. Hexagonal		
	C. Gedrite		iii. Triclinic		
	D. Magnesite		iv. Monoclinic		
	a) A-iii, B-i, C-iv, D-ii	b) A-ii, B-iv, C-i, D-iii	c) A-iv, B-iii, C-i, D-ii	d) A-iii, B-iv, C-ii, D-i	A-iv, B-iii, C-i, D-ii
60	Which one of the following minerals does NOT show the phenomenon of double refraction?				Answer option (b)
	a) Calcite	b) Fluorite	c) Apatite	d) Quartz	Fluorite
61	What is the degree of freedom at the eutectic point in a two-component system?				Answer option (a)
	a) 0	b) 1	c) 2	d) 3	0
62	Which one of the following igneous textures is indicative of eutectic crystallization?				Answer option (b)
	a) perthitic	b) granophyric	c) porphyritic	d) trachytic	granophyric
63	Which of the following statements is/are <b>false</b> ? <b>A.</b> Temperature, as an agent of metamorphism, causes regional metamorphism. <b>B.</b> Mineral recrystallization will occur due to thermal metamorphism. <b>C.</b> Thermally metamorphosed rocks will always be foliated. <b>D.</b> Temperature is the major cause for the metamorphism of subducting oceanic plate.				Answer option (c)
	a) A and B only	b) A, B and C only	c) A, C and D only	d) B, C and D only	A, C and D only
64	What state of stress is represented by the following Mohr diagram?				c

	a) Uniaxial stress	b) Biaxial stress	c) Triaxial stress	d) Isotropic stress	Triaxial stress
65	In a fold where $t'_\alpha = \cos\alpha$ and $T'_\alpha = 1$ , the fold can be classified as:				d
	a) Class 1A	b) Class 1B	c) Class 1C	d) Class 2	Class 2
66	Which of the following statements about deformation is false? A. Deformation is the sum of strain, rigid rotation and translation. B. Strain alone can tell about the deformation history. C. Change in position of particles in a body take place during deformation. D. Mathematically, homogeneous deformation is a linear transformation.				b
	a) A	b) B	c) C	d) D	B
67	A foliated and lineated shear zone rock which has undergone a drastic reduction in grain size by dominantly crystal-plastic processes is _____.				c
	a) Cataclasite	b) Braccia	c) Mylonite	d) Pseudotachylite	Mylonite
68	Choose the correct option about the following statements related to hot spots. A. Hot spots are caused by mantle plumes. B. Hot spots are found in the interior of lithospheric plates. C. Few hot spots are found at the plate boundary. D. Hot spot tracks are formed as the plates move.				d
	a) Only A is true.	b) Only B is true.	c) A and B are true but C and D are false.	d) All the statements are true.	All the statements are true.
69	Which of the following deformation implies that lines along the principal strain axes have the same orientation as they had in the undeformed state?				a
	a) Pure shear	b) Simple shear	c) Non-coaxial deformation	d) Rotational deformation	Pure shear
70	Match the following stages of 'Wilson Cycle' and their present-day examples.				a
	A. Embryonic		i. East African Rift		
	B. Juvenile		ii. Himalaya		
	C. Terminal		iii. Mediterranean Sea		
	D. Suturing		iv. Red Sea		
	a) A-i, B-iv, C-iii, D-ii	b) A-ii, B-i, C-iv, D-iii	c) A-i, B-iv, C-ii, D-iii	d) A-i, B-ii, C-iii, D-iv	A-i, B-iv, C-iii, D-ii
71	Which of the following is an example of continental transform fault?				c
	a) Dauki Fault	b) Karakorum Fault	c) San Andreas Fault	d) Sagaing Fault	San Andreas Fault

72	The Layer 4 of an Ophiolite succession consists of which of the following?				b
	a) Deep sea sediments	b) Mantle peridotite and ultramafic cumulates	c) Plagiogranite, gabbro and sheet dykes	d) Basaltic pillow	Mantle peridotite and ultramafic cumulates
73	Which one of the following faunal sets of marine organisms best represents benthos?				Answer option (a)
	a) polychaetes, pelecypods, gastropods	b) salps, salmons, shrimps	c) sponges, anchovies, bryozoans	d) coelenterates, polychaetes, sardines	polychaetes, pelecypods, gastropods
74	Coprolites are _____.				Answer option (c)
	a) preserved soft parts of organisms.	b) fossilized hard parts of organisms.	c) fossilized excrements of organisms.	d) preserved trails of organic activities.	fossilized excrements of organisms.
75	Which of the following statements is/are <b>true</b> in case of index fossils? A. Index fossils have wide geological distribution. B. Index fossils have wide geographical distribution. C. Index fossils are restricted to specific rock formations. D. <i>Eohippus</i> to <i>Equus</i> are examples of index fossils.				Answer option (d)
	a) A, B, C and D are true.	b) A and B are true.	c) B and C are true.	d) B, C and D are true.	B, C and D are true.
76	Which one of the essential elements is the most critical for growth and production of diatoms in Antarctic waters?				Answer option (b)
	a) silicon	b) iron	c) vanadium	d) molybdenum	iron
77	Which of the following statements about the foraminifera are true? A. In complex forms of foraminifera, the closed end is known as proximal end. B. Foraminifera are mostly benthonic or planktonic in their movements. C. Globigerina is found to be present from Triassic to Cretaceous. D. Foraminiferan Ooze is found at the ocean bottom.				Answer option (c)
	a) A, B and C only	b) A, B and D only	c) B, C and D only	d) A, C and D only	A, B and D only
78	Which of the following marine fossil groups are extensively used in subdividing Mesozoic?				Answer option (b)
	a) Brachiopods	b) Cephalopods	c) Gastropods	d) Trilobites	Cephalopods
79	Match the following table showing marine fossils and the geological time interval where their biostratigraphic utility is established.				Answer option (a)
	A. Ammonites		i. Neogene		
	B. Planktonic foraminifera		ii. Cambrian		
	C. Graptolites		iii. Silurian		
	D. Trilobites		iv. Jurassic		

	a) A-iv, B-i, C-iii, D-ii	b) A-i, B-iii, C-iv, D-ii	c) A-ii, B-iv, C-i, D-iii	d) A-iii, B-ii, C-iv, D-i	A-iv, B-i, C-iii, D-ii
80	Which one of the following groups of organism cannot survive in aphotic depth?				Answer option (d)
	a) bivalves	b) foraminifera	c) echinoids	d) diatoms	diatoms
81	Which of the following is not a Biostratigraphic Unit?				d
	a) Interval zone	b) Range zone	c) Lineage zone	d) Polarity zone	Polarity zone
82	Which of the following sandstone types is most likely to form by the mechanical weathering of a granite?				c
	a) Quartz arenite	b) Lithic arenite	c) Arkose	d) Shale	Arkose
83	Choose the correct option that denotes the processes responsible to form sedimentary rocks from sediments after deposition. A. Recrystallization B. Compaction C. Diagenesis D. Metamorphism				a
	a) B & C	b) B, C & D	c) B & D	d) A, C & D	B & C
84	For the following Assertion (A) and Justification (B), choose the correct option. A: Glacial deposits are poorly sorted. B: Glaciers can carry sediments of different sizes.				b
	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	Both A and B are true, but B is not the correct explanation
85	Match the following sedimentary rocks with their genesis:				c
	A. Evaporite		i. Clastic deposits		
	B. Limestone		ii. Chemical precipitation		
	C. Agglomerate		iii. Pyroclastic deposits		
	D. Sandstone		iv. Organic deposits.		
	a) A-i, B-ii, C-iii, D-iv	b) A-iv, B-ii, C-i, D-iii	c) A-ii, B-iv, C-iii, D-i	d) A-iv, B-iii, C-ii, D-i	A-ii, B-iv, C-iii, D-i
86	Most of the carbonate sediments of the ocean are derived from which source?				d
	a) Fish	b) Crustaceans	c) Coral	d) Foraminifera	Foraminifera
87	Textural maturity of sandstone is determined by which of the following?  A. Relative abundance of quartz grains B. Abundance of matrix C. Degree of rounding D. Degree of sorting  Choose the correct option.				b

	a) A & B	b) C & D	c) A, B & C	d) A, C & D	C & D
88	Which of the following is not included in Paleozoic?				a
	a) Jurassic	b) Ordovician	c) Mississippian	d) Permian	Jurassic
89	Which one of the following is in the increasing order of bathymetry?				Answer option (d)
	a) continental slope-continental shelf-continental rise	b) continental shelf – continental rise – continental slope	c) continental rise – continental slope – continental shelf	d) continental shelf – continental slope – continental rise	continental shelf – continental slope – continental rise
90	Which of the following currents of the Indian ocean is <b>not</b> a seasonal current?				Answer option (c)
	a) West India coastal current	b) East India coastal current	c) South equatorial current	d) North equatorial current	South equatorial current
91	Which of the following statements is/are <b>true</b> ? <b>A.</b> West coast of India experiences semidiurnal tide. <b>B.</b> East coast of India experiences semi-diurnal tide. <b>C.</b> West coast of India experiences diurnal tide. <b>D.</b> East coast of India experiences mixed semidiurnal tide.				Answer option (d)
	a) A only	b) B only	c) C only	d) D only	D only
92	Given below are the two statements. One is labelled as assertion and another as justification. <b>A: Assertion:</b> Black smokers eject hot mineral-laden fluids at the bottom of the ocean. <b>B: Justification:</b> The deep circulating water is superheated by nearby heat source, dissolves minerals and gases and escapes through vents by convection.				Answer option (c)
	a) A is correct and B is incorrect	b) A is incorrect and B is correct	c) Both A and B are correct	d) Both A and B are incorrect	Both A and B are correct
93	Match the types of marine sediments with their sources.				Answer option (b)
	A. Lithogenous sediments		i. Extraterrestrial source		
	B. Biogenous sediments		ii. Hydrothermal vent		
	C. Hydrogenous sediments		iii. Derived from land		
	D. Cosmogenous sediments		iv. Through breakdown of organic compounds		
	a) A-iii, B-i, C-iv, D-ii	b) A-iii, B-iv, C-i, D-ii	c) A-iv, B-ii, C-i, D-iii	d) A-iv, B-iii, C-ii, D-i	A-iii, B-iv, C-i, D-ii
94	Several plankton precipitate calcium carbonate in the upper ocean. Which of the following is <b>INCORRECT</b> during the formation of CaCO <sub>3</sub> ?				Answer option (c)
	a) decrease in pH	b) increase in CO <sub>2</sub>	c) decrease in HCO <sub>3</sub> <sup>-</sup>	d) decrease in CO <sub>3</sub> <sup>2-</sup>	decrease in HCO <sub>3</sub> <sup>-</sup>
95	Which one of the following statements is/are <b>true</b> with respect to the characteristic feature of ocean floor? <b>A.</b> Atlantic Ocean floor is encircled by trenches.				Answer option (c)

	<p><b>B.</b> Indian Ocean floor has the longest mid-oceanic ridge.  <b>C.</b> Pacific Ocean floor is encircled by trenches.  <b>D.</b> The deepest trench is found in the Atlantic Ocean.</p>				
	a) A only	b) B only	c) C only	d) D only	C only
96	Oceanic conveyor belt refers to _____.				Answer option (c)
	a) wind-driven circulation	b) Ekman circulation	c) thermohaline circulation	d) geostrophic circulation	thermohaline circulation
97	The estimated age of the universe is _____.				Answer option (c)
	a) 4.56 billion years	b) 10.1 billion years	c) 13.5 billion years	d) 25.7 billion years	13.5 billion years
98	Which one of the following graphs correctly depicts the decay of a radioactive parent isotope and the growth of its radiogenic daughter?				Answer option (c)
99	<p>Which of the following statements is/are <b>true</b>?</p> <p><b>A.</b> Lithophile elements prefer to concentrate in rock forming minerals in the crust and mantle.  <b>B.</b> Cu, Ag, Zn, Pb, and S are the common lithophile elements.  <b>C.</b> Siderophile elements prefer to concentrate in the earth's mantle.  <b>D.</b> Chalcophile elements tend to form oxide minerals.</p>				Answer option (a)
	a) A only	b) A and B only	c) A and C only	d) C and D only	A only
100	<p>Given below are the two statements. One is labelled as <b>assertion</b> and another as <b>justification</b>.</p> <p><b>A: Assertion:</b> Heat transport mechanism from the core to the base of the mantle is primarily by convection.  <b>B: Justification:</b> Mantle plumes originate at the core-mantle boundary (CMB) from the regions having low heat flux compared to average CMB heat flux.</p> <p>Which one of the following options are correct?</p>				Answer option (d)
	a) Both A and B are correct.	b) A is correct but B is incorrect.	c) Both A and B are incorrect.	d) A is incorrect but B is correct.	A is incorrect but B is correct.
101	Match the minerals with corresponding bonding.				Answer option (c)
	A. Gold	i. covalent and ionic bonding			
	B. Silica	ii. metallic bonding			
	C. Halite	iii. covalent bonding			
	D. Diamond	iv. ionic bonding			
	a) A-iv, B-iii, C-ii, D-i	b) A-ii, B-iii, C-i, D-iv	c) A-ii, B-i, C-iv, D-iii	d) A-iii, B-i, C-iv, D-ii	A-ii, B-i, C-iv, D-iii
102	The compensation depths of calcite and aragonite differ from each other because of different _____.				Answer option (a)

	a) chemical stabilities	b) ocean depth	c) chemical compositions	d) precipitation mechanisms	chemical stabilities
103	Which of the following statements is/are <b>false</b> in case of nucleosynthesis of elements in the solar nebula? <b>A.</b> The He/H ratio of stars are mostly uniform. <b>B.</b> Nuclides with odd numbered neutrons and protons are more stable. <b>C.</b> The abundance of elements exponentially decreases with increasing atomic number. <b>D.</b> Iron is exceptionally low abundant than expected.				Answer option (b)
	a) A and C only	b) B and D only	c) A and D only	d) B and C only	B and D only
104	Which one of the following represents the correct increasing order of abundance of elements in the Earth's crust?				Answer option (c)
	a) O-Si-Al	b) Si-O-Al	c) Al-Si-O	d) O-Al-Si	Al-Si-O
105	Which one of the following ore deposits originates due to the earth's surface process?				Answer option (a)
	a) bauxite	b) sedimentary exhalative deposit	c) layered chromite deposit	d) graphite deposit	bauxite
106	Porphyry-type copper deposits are associated with _____.				Answer option (c)
	a) mid-oceanic ridge setting	b) intra-cratonic rift setting	c) continent-continent collision setting	d) ocean-ocean subduction setting	continent-continent collision setting
107	Which of the following statements is/are <b>true</b> ? <b>A.</b> Superior-type iron formations are predominantly formed during Precambrian. <b>B.</b> Minette-type iron formations are mostly formed during Palaeozoic. <b>C.</b> Magnetite is the dominant oxide in Superior-type iron formations. <b>D.</b> Superior-type iron formations usually contain high-amount of alkalis (>10%).				Answer option (c)
	a) A only	b) A and B only	c) A, B and C only	d) A, B, D only	A, B and C only
108	Greisenisation associated with Sn-W mineralization involves the replacement of the original mineral assemblage by _____.				Answer option (d)
	a) quartz + calcite	b) muscovite + chlorite	c) quartz + chlorite	d) quartz + muscovite	quartz + muscovite
109	Which of the following statements is/are <b>false</b> ? <b>A.</b> Skarn is a fine-grained igneous rock that hosts valuable metal deposits. <b>B.</b> In general, skarns are rich in Ca, Mg, Fe, Al, and Mn. <b>C.</b> Most of the tungsten deposits (>70%) in the world are skarn deposits. <b>D.</b> Burugubanda tungsten deposit in Andhra Pradesh is of skarn-type deposit.				Answer option (d)
	a) A and B only	b) A and C only	c) A and D only	d) C and D only	A and D only
110	Which of the following mineral is precipitated from black smokers?				Answer option



					(b)
	a) Pyrite	b) Pyrrhotite	c) Sphalerite	d) Galena	Pyrrhotite
111	Match the ore deposit with the host rocks.				Answer option (a)
	A. Chromite		i. Tholeiite-komatiite suite		
	B. Niobium		ii. Anorthosite complex		
	C. Ilmenite		iii. Carbonatite		
	D. Nickel sulphide		iv. Layered igneous complex		
	a) A-iv, B-iii, C-ii, D-i	b) A-i, B-ii, C-iii, D-iv	c) A-ii, B-i, C-iv, D-iii	d) A-iii, B-i, C-iv, D-ii	A-iv, B-iii, C-ii, D-i
112	Microlithotypes in clarite are _____.				Answer option (b)
	a) 95% of vitrinite	b) >95% of vitrinite and liptinite	c) >95% inertinite	d) 95% liptinite and inertinite	>95% of vitrinite and liptinite
113	What is the oldest stratigraphic lithounit of Dharwar craton?				Answer option (b)
	a) Amgaon Gorup	b) Gorur Gneiss	c) Sukma Group	d) Peninsular Gneiss	Gorur Gneiss
114	In which craton Mohar Caldreaun is present?				Answer option (d)
	a) Dharwar Craton	b) Bastar Craton	c) Singhbhum Craton	d) Bhundelkhand Craton	Bundelkhand Craton
115	Which of the following statements is/are <b>true</b> on the evolution of Cuddapah basin?				Answer option (b)
	<p>A. The basin is evolved over the Proterozoic basement.</p> <p>B. It is occurring over the eastern Bastar craton.</p> <p>C. The basin was subjected to magmatism during its evolution.</p> <p>D. Eastern margin is highly deformed than the western side.</p>				
	a) A and B only	b) C and D only	c) A, B and C only	d) A and D only	C and D only
116	<p>Given below are the two statements. One is labelled as <b>assertion</b> and another as <b>justification</b>.</p> <p><b>A: Assertion:</b> Crookshank divided the older supracrustals of the Bastar craton into Sukma and Bengpal series.</p> <p><b>B: Justification:</b> Ghosh proposed that both the series represent same group of rocks but varying in facies.</p>				Answer option (c)
	a) A is correct and B is incorrect	b) A is incorrect and B is correct	c) Both A and B are correct.	d) Both A and B are incorrect	Both A and B are correct.
117	The following table shows stratigraphic units and economic deposits within them. Which row in the table represents correct pair?				Answer option (b)
	<b>Stratigraphic unit</b>		<b>Economic deposit</b>		
	A. Udaipur Group		Barite		
	B. Nallamalai Group		Pb-Zn		
	C. Bababudan Group		Phosphorite		
	D. Semri Group		Iron		
	a) A	b) B	c) C	d) D	B
118	What is the lowermost formation in the Cuddapah Supergroup?				Answer option (d)

	a) Cumbum Formation	b) Pullampet Formtion	c) Pulivendla Quartzite	d) Gulcheru Quartzite	Gulcheru Quartzite
119	Within how many millions of years after the formation of the earth, the secondary atmosphere has evolved?				Answer option (b)
	a) 10	b) 100	c) 1000	d) 2000	100
120	Which one of the following is used to understand the composition of palaeo-ocean water?				Answer option (c)
	a) basalt	b) meteorite	c) fluid inclusion	d) volcanic eruption	fluid inclusion
121	As per the proposal of International Commission of Stratigraphy in 2009, the base of the Quaternary Period is fixed by IUGS at:				b
	a)1.80 Ma	b)2.58 Ma	c)23.03 Ma	d)66.0 Ma	2.58 Ma
122	Which hypothesis proposes that climate changes have mainly been driven by CO <sub>2</sub> input into the atmosphere and the ocean by plate tectonic processes?				d
	a) Milankovitch Hypothesis	b) Polar Position Hypothesis	c) Uplift Weathering Hypothesis	d) BLAG Spreading Rate Hypothesis	BLAG Spreading Rate Hypothesis
123	Choose the correct option referring to true statements about the condition during Quaternary Period: A. Climatic variation was very strong during Quaternary Period. B. Sea level was always low during Quaternary Period. C. Glacial episodes were longer than inter-glacials during Quaternary Period. D. Entire earth was covered under ice during glacial period.				b
	a) A&B	b) A&C	c) B&D	d) C&D	A&C
124	What is the age of Mawmluh Cave speleothem in Meghalaya that is ratified as the GSSP marking the base of Meghalayan Age?				b
	a) 2450 years b2k	b) 4250 years b2k	c) 5730 years b2k	d) 8236years b2k	4250 years b2k
125	Choose the correct option to describe about the Quaternary deposits of India.  A. These may be found in the Indus and Ganga plains. B. Bangar and Khadar are alluvial soil formed during Pleistocene and Holocene respectively. C. The Kashmir valley developed during the Pleistocene epoch. D. In India all Quaternary deposits are formed in glacial environment.				c
	a)A only	b) A & B only	c) A, B & C only	d) All of them.	A, B & C only
126	When did the Last Glacial Maxima (LGM) occur?				c
	a) 11000 years ago	b) 15000 years ago	c) 20000 years ago	d) 35000 years ago	20000 years ago

127	Match the following prehistoric time periods/ages with societal/cultural development.				d
	A. Paleolithic	i. Formation of tribes.			
	B. Mesolithic	ii. Beginning of organized society.			
	C. Neolithic	iii. Mobile lifestyle			
	D. Bronze age	iv. Craft and trade begins			
	a) A-i, B-ii, C-iii, D-iv	b) A-iii, B-ii, C-i, D-iv	c) A-iv, B-ii, C-iii, D-i	d) A-iii, B-i, C-ii, D-iv	A-iii, B-i, C-ii, D-iv
128	Dendrochronology refers to dating technique using which of the following?				a
	a) Tree rings	b) Varve	c) Ice core	d) Drainage network	Tree rings
129	In aerial photography when optical axis passes through both nadir and principal point then the photograph is said to be _____. (Fill in the blank)				a
	a) True vertical photograph	b) Tilted photograph	c) High oblique photograph	d) Low oblique photograph	True vertical photograph
130	With which of the following the vertical exaggeration of stereo-model varies directly?				c
	a) Flying height	b) Camera focal length	c) Airbase	d) Eye base	Airbase
131	For the following Assertion (A) and Justification (B), choose the correct option.  A: In radar remote sensing data is collected sideways instead of vertically.  B: Shallow look angle results in different perspective that cannot be obtained otherwise.				b
	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	Both A and B are true, but B is not the correct explanation
132	Topology can be built for which of the following data models?				b
	a) Attribute data only	b) Vector data only	c) Raster data only	d) Both vector and raster data	Vector data only
133	Number of grey shades in a spectral band represents which of the following?				d
	a) Spatial resolution.	b) Spectral resolution	c) Temporal resolution	d) Radiometric resolution	Radiometric resolution
134	Which of the following is/are true for aggregates?				b

	<p>A. Aggregates are used to make concrete.          B. Aggregates are always coarse.          C. Aggregates may be coarse or fine.          D. Aggregates should be deleterious in nature.</p>				
	a) A&B	b) A&C	c) B&C	d) C&D	A&C
135	Which of the following rocks has the highest compressive strength?				a
	a) Granite	b) Marble	c) Sandstone	d) Limestone	Granite
136	Match the following Indian dams and the rivers on which they are constructed.				c
	A. Sardar Sarovar Dam		i. Sutlej River		
	B. Nagarjuna Sagar Dam		ii. Narmada River		
	C. Bhakra Dam		iii. Mahanadi River		
	D. Hirakud Dam		iv. Krishna River		
	a) A-i, B-ii, C-iii, D-iv	b) A-ii, B-iv, C-iii, D-i	c) A-ii, B-iv, C-i, D-iii	d) A-iv, B-iii, C-ii, D-i	A-ii, B-iv, C-i, D-iii
137	Which of the following is the best dimensional stone?				d
	a) Phyllite	b) Shale	c) Marble	d) Granite	Granite
138	The topmost part of a tunnel is called _____. (Fill in the blank)				b
	a) Crown	b) Vault head	c) Invert	d) Arch	Vault head
139	For the following Assertion (A) and Justification (B), choose the correct option. A: Landslide can be prevented by making steeper slope. B: Increase in slope steepness increases the stability of slope.				d
	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	Both A and B are false
140	Which of the following is the pathfinder element for sandstone type uranium deposit?				a
	a) Se	b) Cu	c) Pb	d) Zn	Se
141	Which correction in gravity prospecting allows for surface irregularities in vicinity of the station?				c
	a) Bouguer correction	b) Latitude correction	c) Terrain correction	d) Free-air correction	Terrain correction
142	In which of the sampling methods samples are randomly picked up from loose broken material from outcrops, pits, trenches, mine workings, stope draw points, mine cars, load shipments, and all types of stockpiles?				a
	a) Grab sampling	b) Muck sampling	c) Bulk sampling	d) Channel sampling	Grab sampling
143	Which of the following exploration stages refers to reconnaissance?				d

	a) G1	b) G2	c) G3	d) G4	G4
144	As per UNFC scheme of classification which is equivalent to Proved Reserve?				a
	a) 111	b) 121	c) 122	d) 221	111
145	Which of the following makes the best aquifer?				c
	a) Limestone	b) Quartzite	c) Sandstone	d) Shale	Sandstone
146	Which of the following refers to the ratio of the volume of water that, after saturation, can be drained by gravity to its own volume?				b
	a) Specific gravity	b) Specific yield	c) Specific retention	d) Specific volume	Specific yield
147	Choose the correct option about the following characteristics of a good aquifer.  A. High porosity. B. High permeability. C. High bulk density. D. High consolidation.				a
	a) A&B	b) B&C	c) C&D	d) A&D	A&B
148	What is the maximum permissible limit of TDS in drinking water according to Bureau of Indian Standards?				d
	a) 120 mg/l	b) 180 mg/l	c) 300 mg/l	d) 500 mg/l	500 mg/l
149	Which of the following is the most widely used artificial recharge method of ground water?				b
	a) Ditch-and-Furrow method	b) Basin method	c) Stream-Channel method	d) Flooding method	Basin method
150	Which of the following is the most abundant sedimentary rock in Earth's crust?				d
	a) Limestone	b) Sandstone	c) Conglomerate	d) Shale	Shale