

Test Booklet No. _____

This booklet consists of 100 questions and 12 printed pages.

RGUPET/____/____

Series

NIL

**RGUPET 2023
PH.D. in GEOLOGY**

Full Marks: 100

Time: 3 Hours

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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 100 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 15 minutes after the commencement of the entrance test or leave the examination hall before 30 minutes of end 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 candidate(s) is/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, RGU shall be final and binding.
9. The OMR Answer Sheet consists of two copies, the Original copy and the Student's copy.

1	One of the essential characteristics of research is				d	objectivity
	a) replicability	b) generalizability	c) usability	d) objectivity		
2	An academic association assembled at one place to discuss the progress of its work and future plans. Such an assembly is known as				a	conference
	a) conference	b) seminar	c) workshop	d) symposium		
3	Synopsis of a research work is				a	summary of findings of the research
	a) summary of findings of the research	b) work plan of research	c) combination of objective and methodology	d) summary of previous works		
4	Null hypothesis a statement showing				a	no difference
	a) no difference	b) significant difference	c) linear difference	d) both b and c		
5	Random sampling has the advantage since it is				d	all the above
	a) produces reasonably accurate results	b) free from personal biases	c) cost saving	d) all the above		
6	In which case, the formation of hypothesis may not be mandatory?				a	normative studies
	a) normative studies	b) experimental studies	c) survey studies	d) investigate historical studies		
7	Continuous probability distribution is known as				c	Gaussian distribution
	a) binomial distribution	b) Poisson distribution	c) Gaussian distribution	d) Stoke's distribution		
8	The standard rock reference material "NBS-278" is a				c	basalt
	a) soil	b) basalt	c) dunite	d) shale		
9	The number of times an academic journal article is cited in other published works is known as				b	citation impact
	a) impact factor	b) citation impact	c) journal index	d) RG score		
10	Successful research requires				d	all the above
	a) planning	b) expert	c) guidance	d) all the above		
11	In geochemical analysis, contamination may not arise from				d	non-reactive storage containers
	a) reagents	b) sample handling	c) lab cleanliness	d) non-reactive storage containers		
12	Selection of suitable analytical method depends on				d	both a and b
	a) detection limit	b) sample concentration	c) cost of analysis	d) both a and b		

13	Uniaxial minerals behave isotropic under petrographic microscope when it is oriented				b	perpendicular to c-axis
	a) parallel to c-axis	b) perpendicular to c-axis	c) oblique to c-axis	d) perpendicular to a-axis		
14	Density of bromoform is				b	2.89 g/mL
	a) 2.75 g/mL	b) 2.89 g/mL	c) 3.0 g/mL	d) 3.3 g/mL		
15	Orthopyroxene can be distinguished from biotite under microscope using				c	relief
	a) extinction angle	b) fracture	c) relief	d) interference colour		
16	Which of the following is a non-foliated metamorphic rock?				d	Marble
	a) Schist	b) Gneiss	c) Amphibolite	d) Marble		
17	Amygdales in a basalt can be distinguished from phenocryst by				c	form
	a) composition	b) colour	c) form	d) abundance		
18	Which equipment is used to separate sediments into different fractions according to size?				a	sieve shaker
	a) sieve shaker	b) distillation plant	c) vibratory ball mill	d) ultrasonic bath		
19	Which acid is commonly used to break silicate bond in minerals?				d	hydrofluoric acid
	a) hydrochloric acid	b) nitric acid	c) sulphuric acid	d) hydrofluoric acid		
20	Microfossils are characterized using				d	binocular microscope
	a) polarizing microscope	b) pocket lens	c) hand lens	d) binocular microscope		
21	Which of the following is the best instrument to map a geomorphic feature in the field?				b	Integrated total station
	a) Clinometer compass	b) Integrated total station	c) Dumpy level	d) Abney level		
22	An area of older rock surrounded by younger rock in a geological map is known as:				c	Inlier
	a) Klippe	b) Window	c) Inlier	d) Outlier		
23	What will be the nature of strike lines for a uniformly dipping bedding plane?					

	a) Straight and parallel	b) Straight and intersecting	c) Curved and intersecting	d) Curved but not intersecting	a	Straight and parallel
24	A clinometer compass can be used for which of the following?				d	Measuring both horizontal and vertical angle
	a) Measuring horizontal angle only	b) Measuring vertical angle only	c) Measuring bearing only	d) Measuring both horizontal and vertical angle		
25	What does the symbol  represent in a geological map?				b	Joint plane dipping 65° towards SE
	a) Joint plane striking S65°E	b) Joint plane dipping 65° towards SE	c) Bedding plane striking S65°E	d) Bedding plane dipping 65° towards SE		
26	Rock quality designation (RQD) can be determined for which of the following?				b	Drill cores
	a) Dimension stones	b) Drill cores	c) Aggregates	d) Intact rocks		
27	Brazilian test is conducted for what type of rock specimen?				b	Thin disc by applying diametrical compression
	a) Irregular specimen	b) Thin disc by applying diametrical compression	c) Long core by applying diametrical compression	d) Cubic specimen		
28	Which is the most effective resistivity survey to map water table in case of unconfined aquifer?				d	3D resistivity survey
	a) Vertical electrical sounding	b) 2D resistivity survey with Wenner-Schlumberger array	c) 2D resistivity survey with Dipole-Dipole array	d) 3D resistivity survey		
29	Which of the following measurement to be recorded about the attitude of a planar structure in the field is enough?				a	Dip amount and dip direction
	a) Dip amount and dip direction	b) Dip amount and strike direction	c) Dip direction and strike direction	d) Dip direction only		
30	What is the minimum number of apparent dip to be measured in the field to determine the attitude of a bed?				b	Two
	a) One	b) Two	c) Three	d) Four		
31	Apparent dips of a bedding plane measured on two vertical planes trending N66°E and S29°E are 14° and 57° respectively. What is the attitude of the bed?					

	a) 057°/58°SE	b) 147°/58°SW	c) 057°/48°SE	d) 147°/48°SW		057°/58°SE
32	For working on Jurassic faunal assemblage, which one of the following can be identified as a field area:				a	West coast of India
	a) West coast of India	b) East coast of India	c) Central India	d) Himalayan lakes		
33	Measurement of skewness and kurtosis is an integral part in which of the following problems in geo-scientific research?				d	Sediment size analysis
	a) Petrogenesis	b) Geochemical dating	c) OSL dating	d) Sediment size analysis		
34	Which of the following terrain should be avoided while sampling for geochemical works?				d	All the above
	a) Weathered terrain	b) Leached terrain	c) Altered terrain	d) All the above		
35	A sun compass is used for:				d	Both (b) and (c)
	a) Collection of oriented block samples	b) Collection of oriented drill cores	c) Collection of palaeomagnetic samples	d) Both (b) and (c)		
36	For getting younger rock groups in the field, the traverse should be taken:				c	Along down dip direction
	a) Along the strike	b) Along up dip direction	c) Along down dip direction	d) Oblique to the strike		
37	The best diagram to represent sedimentary palaeochannel flow or volcanic lava flow is:				c	Rose diagram
	a) Pie diagram	b) Beta diagram	c) Rose diagram	d) None of the above.		
38	The best way to observe cross bedding structures in a recent sedimentary terrain is to:				b	Dig out trench and channels
	a) See vertical section of the dune.	b) Dig out trench and channels	c) Grab sampling	d) All the above.		
39	Which of the following field observation indicates a Gondwana coal terrain?				a	Presence of lamprophyre dykes
	a) Presence of lamprophyre dykes	b) Presence of dolerite dykes	c) Increase in carbon content	d) None of the above		
40	To encounter the variation of rock type traverses in the field should be taken along:				b	dip direction
	a) strike direction	b) dip direction	c) both strike and dip	d) along apparent dips		

41	For mineralogical studies, the direction along which preparation of thin section should be avoided is:				a	Basal section
	a) Basal section	b) Section parallel to cleavage	c) Section perpendicular to cleavage	d) Oblique sections		
42	The gum which is used for amalgamating a rock section to glass slide is/are:				d	Both (a) and (b)
	a) Canada balsam	b) Araldite	c) Cyanoacrylate	d) Both (a) and (b)		
43	For analogue modelling, the best representative material for experiment is:				d	Both (a) and (b)
	a) Silicon putty	b) Mixture of mud and water	c) Mixture of flour and honey	d) Both (a) and (c).		
44	For preparation of rock sections for microstructural direction studies, sections should be prepared preferably along:				d	One along N-S plane and one along E-W plane.
	a) Along the dip	b) Along the strike	c) Along mineral lineation	d) One along N-S plane and one along E-W plane.		
45	Plain paper mapping is necessary in:				a	Lithological mapping
	a) Lithological mapping	b) Structural mapping	c) flow direction mapping	d) Geophysical mapping		
46	The method of fabric analysis in a structurally isotropic or massive terrain preferably is:				c	Anisotropy of magnetic susceptibility analysis
	a) Fractal analysis	b) EBSD analysis	c) Anisotropy of magnetic susceptibility analysis	d) Palaeomagnetic analysis		
47	The relationship between different geochemical attributes of a rock can be studied using:				b	Principal component analysis
	a) Measures of central tendency	b) Principal component analysis	c) Measures of dispersion	d) All the above.		
48	To relate grain size analysis of sedimentary rock with their depositional environment, which statistical technique cannot be used?				c	Correlation
	a) Skewness	b) Kurtosis	c) Correlation	d) Dispersion		
49	A researcher working in a geological terrain with a major river flowing in the terrain with an almost constant flow direction. The exposures of the rocks of that terrain are also found along the banks of that river. What should be the interpretation from this?					

	a) The river has eroded away the rocks in the areas of exposure.	b) The river is a structural one flowing along the fault	c) Both a and b	d) None of the above.	b	The river is a structural one flowing along the fault
50	The best way to represent Himalayan cross section is:				b	Preparation of balanced cross section
	a) Geophysical profiling	b) Preparation of balanced cross section	c) Studying window sections	d) Studying klippe		
51	Styrolitic foliations are associated with:				c	Limestone
	a) Sandstone	b) Shale	c) Limestone	d) None of these		
52	Earthquake is an example of:				c	Visco-elastic behaviour
	a) Perfectly elastic behaviour	b) Perfectly viscous behaviour	c) Visco-elastic behaviour	d) Elasto-viscous behaviour		
53	Joints that are developed perpendicular to the fold axes are called:				a	Extensional joints
	a) Extensional joints	b) Released joints	c) Tension joints	d) Shear joints		
54	Mullions are formed under:				a	Compressive stress regime
	a) Compressive stress regime	b) Tensile stress regime	c) Shearing	d) All the above		
55	Sorting of particles is best in				c)	Beach sediments
	a) Fluvial sediments	b) Sand dunes	c) Beach sediments	d) Loess sediment		
56	Residual deposits are				b)	Unsorted and angular
	a) Well sorted and rounded	b) Unsorted and angular	c) Ill sorted and sub-rounded	d) Assorted and well rounded		
57	In flaser bedding the conditions are more favourable for the deposition and preservation of					

	a) Sand	b) Mud	c) Both sand and mud	d) None of the above	b)	
58	A bed set consists of two or more superimposed beds having identical				d)	Genesis
	a) Colour	b) Composition	c) Texture	d) Genesis		
59	The ratio of radiant exitance of an object at a given temperature to that of a black body at same temperature is:				c	emissivity.
	a) radiant temperature.	b) kinetic temperature.	c) emissivity.	d) emittance.		
60	Which satellite employed push-broom scanning technique for the first time?				c	SPOT-1
	a) Landsat-1	b) IRS-1A	c) SPOT-1	d) JERS-1		
61	Overlay analysis can be performed for which of the following data?				c	Both vector and raster data
	a) Vector data only	b) Raster data only	c) Both vector and raster data	d) Attribute data		
62	For delineating drainage from DEM, the first step is to generate which of the following raster?				b	Flow direction
	a) Flow accumulation	b) Flow direction	c) stream network	d) Stream link		
63	Echinoids evolved during:				b	Ordovician
	a) Cambrian	b) Ordovician	c) Silurian	d) Devonian		
64	The trilobite fauna is restricted to:				a	Lower palaeozoic
	a) Lower palaeozoic	b) Upper palaeozoic	c) Mesozoic	d) Cenozoic		
65	Dinosaurs were extinct in the:				c	K-T extinction
	a) P-T extinction	b) Lower Ordovician extinction	c) K-T extinction	d) Upper Permian extinction		
66	The valves of the inarticulates are _____ in shape.					

	a) Biconvex	b) Biconcave	c) Conical	d) Circular	c	Conical
67	The floral species "Williamsonia" is a:				a	Cycad
	a) Cycad	b) Conifer	c) Fern	d) Bryophyta		
68	Which of the following is called the 'Age of Mammals'?				c	Cenozoic
	a) Palaeozoic	b) Mesozoic	c) Cenozoic	d) None of the above		
69	Yashwantnagar Formation is grouped under				b	Dharwar Supergroup
	a)Sargur Group	b)Dharwar Supergroup	c) Warangal Group	d) Salem Group		
70	Kanthkot Sandstone of Jurassic age belongs to				b	Chari
	a)Pachcham	b) Chari	c)Katrol	d)Umia		
71	Kallakkudi limestone (Dalmiapuram) is grouped under				a	Uttatur Group
	a)Uttatur Group	b) Trichinopoly Group	c)Ariyalaur Group	d)Niniyur Formation		
72	Red boles in Deccan Volcanic Province is usually contain				a	nantronite
	a)nantronite	b)illite	c) quartz	d) plagioclase		
73	Deccan Volcanic Province is estimated to be erupted during				d	Cretaceous-Eocene
	a) Proterozoic	b)Cambrian-Ordovician	c) Triassic-Jurassic	d) Cretaceous-Eocene		
74	Layer 3 of the ophiolite is composed of				b	gabbro
	a) pillow basalts	b) gabbro	c) peridotite	d) deep-sea sediment		
75	Cumulate texture results due to					

	a) partial melting	b) eutectic crystallization	c) filter pressing	d) gravity settling	d	Gravity settling
76	Degree of freedom along liquidus line in diopside-anorthite binary system is				b	1
	a) 0	b) 1	c) 2	d) 3		
77	When did the Himalayan orogenesis begin?				b	70 million years ago
	a) 130 million years ago	b) 70 million years ago	c) 30-35 million years ago	d) 15-20 million years ago		
78	Himalaya is an example of which stage of Wilson cycle?				d	Suturing stage
	a) Embryonic stage	b) Mature stage	c) Terminal stage	d) Suturing stage		
79	What is the age of Se La Group?				a	Palaeo-Proterozoic
	a) Palaeo-Proterozoic	b) Meso-Proterozoic	c) Neo-Proterozoic	d) Palaeozoic		
80	Bhareli Formation belongs to which of the following groups?				b	Gondwana Group
	a) Yinkiong Group	b) Gondwana Group	c) Bomdila Group	d) Se La Group		
81	Which of the following is responsible for most of the earth's internal heat?				b	Radioactive decay
	a) Primordial heat	b) Radioactive decay	c) Rotational friction	d) Tidal friction		
82	Which of the following process starts when the rate at which rain is falling exceeds the rate at which it can percolate into the soil?				c	Hortonian overland flow
	a) Seepage flow	b) Saturation overland flow	c) Hortonian overland flow	d) Throughflow		
83	The coastal zone between high-tide shoreline and low-tide shoreline is:				a	Foreshore
	a) Foreshore	b) Backshore	c) Nearshore	d) Offshore		
84	Which of the following is an example of river-dominated delta?					

	a) Ganga-Brah maputra delta	b) Mississippi delta	c) Nile delta	d) Indus delta	b	Mississippi delta
85	In Uranium deposits of Sandstone types, the indicator element is:				a	Selenium
	a) Selenium	b) Copper	c) Arsenic	d) Zinc		
86	Which one of the following is the most successful method for chrome ore beneficiation?				d	Tabling
	a) Spiralling	b) Jigging	c) Heavy media separation	d) Tabling		
87	In open pit mining, the ratio of the waste rock mined to ore is called:				b	Stripping ratio
	a) Working ratio	b) Stripping ratio	c) Recovery ratio	d) None of these		
88	The p-wave velocities are highest in				a	Air
	a) Air	b) Water	c) Sand	d) Granite		
89	Si is the second most abundant element in the earth's crust after oxygen. It occupies ---% of the total volume of the crust.				d)	27%
	a) 1%	b) 4%	c) 21%	d) 27%		
90	Rubidium is usually found dispersed in				a)	K-rich minerals
	a) K-rich minerals	b) Ca-rich minerals	c) Na-rich minerals	d) Alkali-rich minerals		
91	The upper mantle having _____.				b)	Ultrabasic composition
	a) Granitic composition	b) Basic composition	c) Ultrabasic composition	d) Felsic composition		
92	Elements with completely full outermost shells are grouped under				d)	Atmophile
	a) Lithophile	b) Chalcophile	c) Siderophile	d) Atmophile		
93	Most of the fuels have:					

	a) Degeneration	b) Combustion	c) Explosion	d) Rapid combustion	d)	Rapid combustion
94	The cooking gas is mainly a mixture of the following two gases				c)	Propane and Butane
	a) Methane and Ethane	b) Ethane and Propane	c) Propane and Butane	d) Butane and Pentane		
95	Benzene reacts with CO and HCl under pressure to form				d)	C_6H_5COOH
	a) C_6H_5Cl	b) C_6H_5CHO	c) $COCl_2$	d) C_6H_5COOH		
96	Which type of coals has the highest grindability index?				d)	Pulverized coals
	a) Steam coals	b) Gas coals	c) House coals	d) Pulverized coals		
97	Which of the following is not a component of shear strength?				d)	Dry density
	a) Angle of internal friction	b) Tensile strength	c) Cohesion	d) Dry density		
98	Which of the following is one of the parameters used in rock mass rating?				c)	Joint roughness
	a) Fault displacement	b) Shrinkage limit	c) Joint roughness	d) Seismic wave velocity		
99	The product of the hydraulic conductivity and the saturated thickness of an aquifer is _____. (Fill in the blank)				b)	Transmissivity
	a) Storativity	b) Transmissivity	c) Permeability	d) Diffusivity		
100	Hydrostatic equilibrium existing between the densities of fresh water and seawater can be expressed with which of following?				a)	Ghyben-Herzberg relation
	a) Ghyben-Herzberg relation	b) Darcy's law	c) Allen Hazen's formula	d) Debye-Huckel equation		

SPACE FOR ROUGH WORK