

## **Geological Society of India EARTH SCIENCE OLYMPIAD – Entrance Test**



Date: January 16, 2016; Time: 10.30 am to 12.00 noon

### INSTRUCTIONS

- 1. You have to be present in the examination hall well before the commencement of the test.
- 2. You will not be permitted to enter the examination hall 30 minutes after the commencement of the test.
- 3. You will not be permitted to leave the examination hall until after 30 minutes of commencement of the test.
- 4. If you have any paper/chit with you, surrender them to the invigilator now.
- 5. All are multiple-choice questions.
- 6. Please use a BLACK/BLUE ball point pen to mark your answers. DO NOT use pencil.
- 7. This sheet should not be folded or crushed
- 8. Choose the MOST appropriate answer.
- 9 Darken the circle corresponding to the answer of your choice.
- 10. Do not use stray marks on the sheet. An Example

Question	Answe	er		
The shape of the Earth is	A	В	С	D
(A) Spherical (B) Spheroidal (C) Ovoid (D) Ellipsoidal	0	•	0	0

- Marks will not be awarded if more than one answer is chosen.
- Your answer must be given only in the answer sheet (overleaf) and handover the answer sheet to the invigilator
- 7. Please enter your Registration No. and affix your signature on the answer sheet before starting to answer the questions.
- 8. The answer keys will be published in Geological Society's Web site: http://www.geosocindia.org/index.php/ieso on 18th January 2016

#### Dear Student

We appreciate your	interest in the	International	Earth Science	e Olympiad.	Please sper	ıd a minute
to let us know how y	you learnt abou	it the IESO-Ei	ntrance Test (	can choose i	more than o	ne option).

- ☐ From my school / college
- ☐ *IESO Poster*
- $\Box$  From a friend
- ☐ From Geological Society's Web site
- ☐ From other source, specify

Please send your comments on the question paperwithin a week by email (<u>hachyuthan@yahoo.com</u>) with copy endorsed to gsocind@gmail.com, or by regular mail to:Prof. Hema Achyuthan, Head, Department of Geology, Anna University, Chennai – 600 025.



# Geological Society of India <u>EARTH SCIENCE OLYMPIAD – Entrance Test</u> Date: January 16, 2016; Time: 10.30 pm to 12.00 pm



Name of the Candidate:	Regn No.:
Name of the School & Class:	_
Name of the Test Center:	
Student's Signature:	Signature of the Invigilator

### **ANSWER SHEET**

Q.No.	A	В	C	D	Q.No.	A	В	C	D	Q.No.	A	В	C	D	Q.No.	A	В	C	D
1	0	0	0	0	26	0	0	0	0	51	0	0	0	0	76	0	0	0	0
2	0	0	0	0	27	0	0	0	0	52	0	0	0	0	77	0	0	0	0
3	0	0	0	0	28	0	0	0	0	53	0	0	0	0	78	0	0	0	0
4	0	0	0	0	29	0	0	0	0	54	0	0	0	0	79	0	0	0	0
5	0	0	0	0	30	0	0	0	0	55	0	0	0	0	80	0	0	0	0
6	0	0	0	0	31	0	0	0	0	56	0	0	0	0	81	0	0	0	0
7	0	0	0	0	32	0	0	0	0	57	0	0	0	0	82	0	0	0	0
8	0	0	0	0	33	0	0	0	0	58	0	0	0	0	83	0	0	0	0
9	0	0	0	0	34	0	0	0	0	59	0	0	0	0	84	0	0	0	0
10	0	0	0	0	35	0	0	0	0	60	0	0	0	0	85	0	0	0	0
11	0	0	0	0	36	0	0	0	0	61	0	0	0	0	86	0	0	0	0
12	0	0	0	0	37	0	0	0	0	62	0	0	0	0	87	0	0	0	0
13	0	0	0	0	38	0	0	0	0	63	0	0	0	0	88	0	0	0	0
14	0	0	0	0	39	0	0	0	0	64	0	0	0	0	89	0	0	0	0
15	0	0	0	0	40	0	0	0	0	65	0	0	0	0	90	0	0	0	0
16	0	0	0	0	41	0	0	0	0	66	0	0	0	0	91	0	0	0	0
17	0	0	0	0	42	0	0	0	0	67	0	0	0	0	92	0	0	0	0
18	0	0	0	0	43	0	0	0	0	68	0	0	0	0	93	0	0	0	0
19	0	0	0	0	44	0	0	0	0	69	0	0	0	0	94	0	0	0	0
20	0	0	0	0	45	0	0	0	0	70	0	0	0	0	95	0	0	0	0
21	0	0	0	0	46	0	0	0	0	71	0	0	0	0	96	0	0	0	0
22	0	0	0	0	47	0	0	0	0	72	0	0	0	0	97	0	0	0	0
23	0	0	0	0	48	0	0	0	0	73	0	0	0	0	98	0	0	0	0
24	0	0	0	0	49	0	0	0	0	74	0	0	0	0	99	0	0	0	0
25	0	0	0	0	50	0	0	0	0	75	0	0	0	0	100	0	0	0	0



## EARTH SCIENCE OLYMPIAD – Entrance Test 16 January-2016 Time: 90 minutes ANSWER ALL QUESTIONS Total 100



### questions. Marks: 100

1.	What	is the thickness of	f the Earth's atmospl	here?	
	a.	100 km	b. 50 km	c. 10 km	d 1000 km
2.	What	is the third largest	constituent of Earth	's atmosphere?	
	a.	Oxygen	b. Nitrogen	c. Argon	d. Krypton
3.	What i	is the largest const	ituent of the atmosp	here of Venus and N	Mars?
	a.	Oxygen	b. Nitrogen	c. Argon.	d. Carbon-dioxide
4.	What	is the maximum v	vater vapour content	of Earth's atmosph	ere?
	a.	100%	b. 50% c. 2	d. 3%	
5.	What	is the typical mon	soon rainfall over Ir	ndia?	
	a.	100cm	b. 50cm	c. 100mm	d. 50mm
6.	Whic	h of the following	states receives the n	naximum monsoon	rainfall?
	a. I	Meghalaya b. Ker	rala c. Tamil N	adu d. Karna	ıtaka
7.	West	ern disturbance oc	curs during		
	a. N	March b. Jun	e c. August	d. Septe	mber
8.	Most	t depression that ca	auses rain over the In	ndo-Gangetic belt fo	orm in the
		a. Southern Bay oc. Southern Arab	of Bengal b. North ian Sea d. North	hern Bay of Bengal thern Arabian Sea	
9.	An ar	nemometer measur	res		
	a.	rainfall	b. humidity	c. wind speed	l. wind direction
10.	Sun	emits maximum po	ower at the waveleng		
	a.	green	b. blue c. re	ed d. ultrav	iolet
11.		C	he Solar Constant is		
	a.	$1400 \text{ W/m}^2$	b. 1300 W/m <sup>2</sup>	c. $1360 \text{ W/m}^2$	l. 1460 W/m <sup>2</sup>
12.	Wier a. c.	Surface temperat			radiated by stars

13. Po	ower radiated	by a star is pro	portiona	l to the $\_$	powe	r of its surface to	emperature
	a. First	b. se	econd		c. third	d. fourth	
14. T	ypical glaciate	d forms are					
		nd hogbacks ans and cones		orns and A	Arêtes ill terraces		
15. A	small flat-top	ped hill bound	led by cli	ffs is kno	wn as		
	a. Plateau	b. T	errace	c. Mes	a	d. Abrasion	platform
16. G	iven the same	climatic cond	itions, dr	ainage de	nsity values	will be lowest of	on
	a. Shale	b. P	hyllite	c. Grai	nite	d. Gabbro	
17. Se	ea cliffs are no	t associated w	ith				
	a. Shore plat	tform b. C	Caves	c. Natı	ıral Arches	d. Pediment	s
18. A		rea of desert	covered	with win	d-swept sar	nd with little or	no vegetative
	a. Hamada	b. B	Bajada		c. Erg	d. Playa	
19. T	he Dead Sea, I	Lake Tanganyi	ika and L	ake Nyas	sa (Malawi)	are examples of	:
	<ul><li>a. Volcanic</li><li>c. Lakes of t</li></ul>	lakes ectonic origin		kes form tificial la	ed by landsl kes	ides	
20. Fı	rost action is a	type of					
	a. Physical v c. Biologica	weathering I weathering			mical weath chemical w	•	
21. O	ne of the follo	wing rivers do	es not flo	ow into th	ne Atlantic (	Ocean	
	a. Zambezi	b. C	Congo or	Zaire	c. C	Orinoco	d. Orange
22. T	he best examp	le of bird's foo	ot or digi	tate delta	is provided	byrive	r
	a. Nile	b. Rhine	c. Mi	ississippi	d. N	Niger	
23. O	ne of the follo	wing drainage	patterns	provides	an evidence	e of river capture	e
	a. Annual pa c. Trellis pat			arbed patt adial patte			
24. O	ne of the follo a. developm c. thickening			b. deve	lerated soil elopment of ease in sedin	gullies	
25. T		uence upon cli he annual tem he annual tem	perature 1	range.		the annual preci	pitation total.

- 26. Which type of trees is commonly found in the monsoon region?

  a. Evergreen
  b. Conifers
  c. Broad leaved deciduous
  d. Thorny bushes
- 27. Which one of the following coastal features is formed by wave erosion?
  a. Beach b. Dune c. Spit d. Stack
- 28. What is the term that is used for the layer of loose, assorted weathered material over rocky slopes?
  - a. Soil b. Laterite c. Regolith d. Alluvium
- 29. When you look at Dinosaurs & birds, do you think birds are evolved from Dinosaurs?

c. Not at all

d. No comparison

30. Identify the following Gastropod shell

b. No

a. Yes



- a. Conus b. Fuses c. Physa d. Nautical
- 31. Name the type of structure encountered during your travel along ancient rocky terrain, which shows stratiform, columnar and nodular structures in carbonate rocks resulting from the combination of life activity and sediment trapping and binding ability of algal assemblages and preying bacteria.
  - a. Solitary corals b. Stromatolites c. Schist rock d. Slate
- 32. Match the list I & II and chose your answer using given codes

	I		II
1	Ostracod	R	Plate
2	Foraminifera	S	Gastropod
3	Echinoderm	T	Carapace
4	Turbo	U	Test

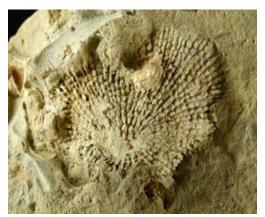
Answer	1	2	3	4
a	T	U	R	S
b	U	T	S	R
С	S	T	U	R
d	R	S	T	U

- 33. The bedding showing gradation in grain size is\_\_\_\_\_
  - a. Planar bedding

- b. Growth bedding
- c. Concordant bedding
- d. Graded bedding

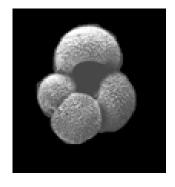
- 34. In which of the following environment would you expect to find Oscillation Ripple marks?
  - a. Alluvial
- b. Beach
- c. Deep sea
- d. Estuary
- 35. Which of the following will not make a fossil?
  - a. Decomposed organic material
- b. Plant impressions
- c. Animal footprints
- d. Loose animal bones
- 36. What scientific avenue of investigation gave scientists the best estimate of the age of the Earth?
  - a. Dating of fossils
- b. Archeological dating
- c. Radiometric dating
- d. Carbon dating
- 37. In which Phylum Trilobite belongs to \_\_\_\_\_
  - a. Arthropod
- b. Protozoa
- c. Bryozoans
- d. Chordates

- 38. Petrified fossil is formed
  - a. When minerals replace all or part of a plant
  - b. Solid copy of the shape of an organism
  - c. An extremely thin coating of carbon on rock
  - d. An extremely thick coating of carbon on rock
- 39. Which phylum this fossil belongs to?



a. Phylum : Brachiopodb. Phylum : Bryozoac. Phylum : Molluscad. Phylum : Chordata

- 40. Is this fossil planktic, benthic, neritic, terrestrial foraminifera?
  - a. Planktic
- b. benthic
- c. neritic
- d. terrestrial



41. What	t is Coprolite?			
	a. Fossilized Dung c. Microfossil	b. Vertebrate d. Fossilized		
	ral valve is larger th a options;	an dorsal valve with po	edicle opening.	Identify the fossil from the
	a. Turbo	b. Turetella	c. Terebratula	d. Trinucleus
43. Choo	se the sediment text	ture from order of large	est to smallest	
b c	Boulder-Cobble-C  b. Boulder-Sand-C  Sand-Boulder-Gra  Clay-Sand-Boulde	vel-Clay		
44. What	t is the depth range of	of the oceans?		
a	. 0 to 400 m	b. 0 to 11000 m	c. 0 to 40,000	d. 0 to 4000 cm
45. What	t is the average salt	content (salinity) of the	e ocean?	
a	. 35%	b. 3.5%	c. 0.35%	d. 0.035%
46. What	t is the major dissolv	ved cation in the ocean	?	
a	. Potassium b.	Sodium c. Mag	gnesium d. Ca	lcium
47. What	is the major dissolv	ved anion in the ocean	?	
a	. Chloride	b. Sulphide	c. Nitrate	d. Phosphate
48. Whic	ch one of the following	ing gases is nor dissolv	ed in the ocean	n?
a	. Oxygen	b. Carbon dioxide	c. Nitrogen	d. Hydrogen
49. What	t is the typical tempo	erature of the oceans in	the equatorial	region?
a	. 30°C	b. 15°C	c. 10°C	d. 50°C
50. Whic	ch zonal belt of the o	oceans has the highest	salinity?	
8	a. Equator	b. 30°N and 30°S	c. 10°N & 10	°S d. Poles
follo a b c	wing. Cooling of the su Supplying nutrier Reducing the pH	rface ocean nts to the surface ocean of the surface ocean ohyll content of the sur	1	es not cause one of the
52. If a ts	-	of 100 m/s, what is the	•	
a	. 100m	b. 10m	c. 1000m	d. 1m

33. Which of the following	· ·		
a. Polar	b. Tropical	c. Mid-latitude	d. Equatorial
54. Which of the following	is a marine plant?	?	
<ul><li>a. Coccoliths</li><li>55. Which of the following</li></ul>	b. Foraminifera organisms make		d. Copepods
a. Foraminifera	b. Diato	oms c. Coccoliths	d. Pteropods
56. How the age of marine	microfossils deter	rmined?	
a. Counting rings		b. Counting x-ray boa	rds
c. Radio carbon d		d. Amino acid racemi	
57. Which of the following	features are assoc	ciated with volcanicall	y derived rocks
1. Vesicles 2. Ar	nygdules	3. Ropy lava	4.Glass
a. (1 and 2) b (2 and 3) c. (3 and 4) d. (1, 2, 3 and 4)			
58. Identify the most abund	ant rock of the cr	ust of the earth	
a. Slate	b. Marble	c. Phyllite	d. None of the above
59. Identify the type of bou	ndaries associated	d with the Indian plate	
1. Convergent 2. Di a. (1)	vergent 3. Island b. (1 and 2)	d-arc 4. Passive c. (1, 2 and 3)	d. (1, 3 and 4)
60. Two tectonic plates mor	ving towards each 2. Island-arc	on other give rise to the 3. Trench	formation of: 4. Mid-oceanic ridge
a. (1)	b. (1 and 2)	c. (1, 3 and 4)	d. (1, 2 and 3)
61. Fragments of the erstwh	nile ocean floor fo	ound to occur on land p	present in orogenic belts are:
		-	es and pillow lavas 4. Mélange
<ul><li>a. (1, 4)</li><li>b. (2 and 3)</li><li>c. (1 and 3)</li><li>d. (1, 2, 3 and 4)</li></ul>			
62. Average composition of	f the Upper Contin	nental Crust of the Ear	th is
a. Granitic	b. Basaltic	c. Granodioriti	c d. Ultramafic
63. Lherzolites are the most	abundant rocks i	in the Earth's	
a. Crust	b. Mantle	c. Outer core	d. Inner core

04. A fock w	nich is compose	ed of quartz and f	erdspar as essentiar	minerals is called
a. Gr	anite	b. Syenite	c. Gabbro	d. Norite
65. A rock co	omposed of pyro	oxene and plagiod	clase is known as:	
1. Gra	anite 2. Gabbro	3. Basalt 4. Sye	nite	
a. (1	*			
b. (2	) and 3)			
,	3 and 4)			
`	,	ine solid of variab	ole composition is sa	aid to form
a. I	somorphism	ŀ	o. Solid solution	
c. P	olymorphism	C	l. Pseudomorphism	
67. Of the fol	lowing mineral	s which one occu	rs in the mantle tran	nsition zone
a.	Tridymite	b. Cristobalite	c. Coesite	d. Stishovite
68. Match the	e following and	chose the correct	option	
V. Lit		1. Syenite		
	atinum	2. Peridot		
	anomagnetite amonds	3. Gabbro 4. Pegma		
1. 1	umonas	5. Kimbe		
	(V-3 W-5 X-4			
	(V-4 W-2 X-3 \)	,		
	(V-5 W-2 X-4 (V-2 W-3 X-5			
		,		
69. Select in 1. Qu		sing stability in th 2. Felspars	ne weathering cycle 3. Muscovite	the following minerals:
a. (2,		b. (1, 2, 3)	3. Widseovite	,
c. (3,	1, 2)	d. (3, 2, 1)		
70. Conrad d	iscontinuity is a	a seismic interface	e between	
	Crust and Mar		-	oper Crust and Lower Crust
C.	. Upper Mantle	and Lower Mant	le d. Lo	wer Mantle and Outer Core
71. Andesites	•		land-arc volcanism	because
a.		y collision of two	-	tinantal amat
b. c.		rom an acidic mag	om oceanic and cong gma	illicital clust
d.		rom melting of an	=	
72. The bigge	est asteroid kno	wn is:		
a.	Vesta	b. Icarus	c. Ceres	d. Eros

73. One J	upiter day is equal	to which of the folio	wing?	
	a. 30 hrs 40 mir	b. 9 hrs 50 n	min c. 3 hrs 20 n	nin d. 52 hrs 10 min
74. The su	a. 3 years	b. 11 years	c. 26 years	d. 50 years
75. The gr	eatest distance bet	ween Earth and the S	un is called what:	
_	a. Apihelion		n c. Perigee	d. Apogee
76. The or	bital plane of the i	moon is how many de	egrees inclined from the	e ecliptic?
	a. 5 degrees	b. 10 degree	es c. 15 degree	s d. 20 degrees
77. A puls	ar is actually a:			
	<ul><li>a. Black hole</li><li>c. Red giant</li></ul>	b. White dw d. Neutron s		
78. Which	of the following i	s formed during the v	weathering of rocks on	the surface of Earth?
	a. Quartz	b. Feldspar	c. Muscovite	d. Bauxite
79. Py	cnocline indicates	the vertical distributi	on of	
	a. Temperature	b. Salinity	c. Density	d. Oxygen
80. Which	of the following h	nas the highest Albed	o	
	a. Clouds	b. Fresh Snow	c. Water d. Ve	egetation
81. Hydrai	ulic conductivity i	s high in an Aquifer c	composed of	
	a. Mudstone	b. Sandstone	e c. Granite	d.Schist
82. Which	n of the following	is present day remnar	nt of Tethys Sea	
	<ul><li>a. Sargossa Sea</li><li>c. Mediterranea</li></ul>		outh China Sea ering Sea	
83. Among	g the minerals liste	ed which has the least	thardness	
	a. Quartz	b. Gypsum	c. Corundum	d. Orthoclase
84. Coral 1	reefs are composed	d of		
	a. Sandstone	b. Phosphor	ite	
	c. Limestone	d. Siltstone		
85. Gondv	vana Coals of Indi	a are richer in		
	<ul><li>a. Carbon</li><li>c. Sulfur</li></ul>	b. Iron d. Aluminiu	m	
86. Which	of the following	will have poorest sort	ing of sediments	
	a. Eolian	b. Fluvial	c. Coastal	d. Glacial

87. Which of the following ha	is least residence th	ne in sea water		
a. Sodium	b. Iron	c. Chlorine	d. Manganese	
88. How many minerals in the	Mohs scale of har	dness are silicates		
a. 1	b. 2	c. 3	d. 4	
, ,	NOT true es are surface waves faster than S waves		waves are body waves es are body waves	
90. The Oceanic crust is not	older than			
<ul><li>a. Permian</li><li>c. Jurassic</li></ul>		b. Triassic d. Cretceous		
91. the oldest of the Geomagn	netic Scale is			
<ul><li>a. Brunhes</li><li>c. Matuyama</li></ul>		b. Gilbert d. Gauss		
92. The Flysch formations are				
<ul><li>a. Syn-tectonic</li><li>c. Post-tectonic</li></ul>		<ul><li>b. Pre-tectonic</li><li>d. All of the above</li></ul>		
93. Natural Leeve is an examp	ple of			
<b>±</b>	<ul><li>a. Point bar deposit</li><li>b. Channel fill deposit</li><li>c. Flood plain deposit</li><li>d. Glacial deposit</li></ul>			
94. A Sinter is				
<ul><li>a. Dissolved Silica</li><li>c.Dissolved Phosphorus</li></ul>		<ul><li>b. Dissolved Calcium carbonate</li><li>d. None of the above</li></ul>		
95. Cirques are mainly associ	ated with			
a. Streams	b. Glaciers	c. Oceans	d. All of the above	
96. Aragonite crystallises in v a. Cubic	vhich crystal syste b. Monoclii	nic c. Triclin	ic d. Orthorhombic	
97. Quartz is				
a. Non magnetic		<ul><li>b. Strongly magnetic</li><li>d. None of the above</li></ul>		
98. The average value of Pois a. 0.25	sons value of rocks b. 0.50	is c. 1.0	d. 1.50	
99. Joints are encountered in	0. 0.30	c. 1.0	u. 1.50	
		Igneous rocks		
c. Metamorphic ro	ocks d. A	d. All of the above		
100. Marine organisms wh	ich are confined to	normal saline water	are called	
<ul><li>a. Euryhaline</li><li>c. Polyhaline</li></ul>		<ul><li>b. Stenohaline</li><li>d. None of the above</li></ul>		