JAM 2015

Question Paper with Answers



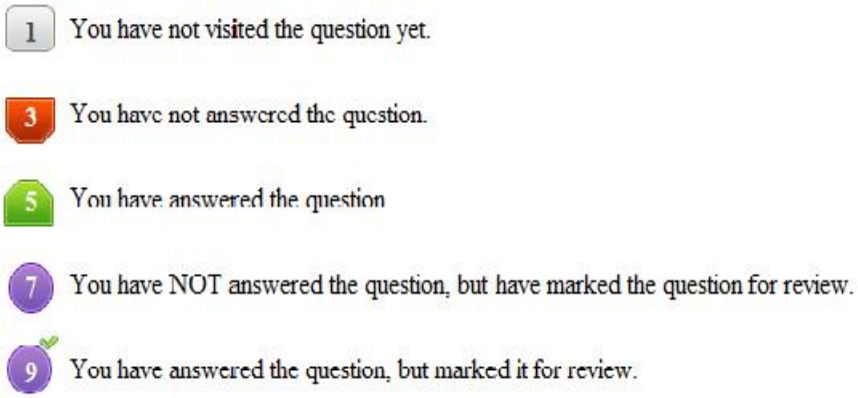
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http://admission.aglasem.com/jam-previous-year-question-papers/

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JAM 2015: General Instructions during Examination

1. Total duration of the JAM 2015 examination is **180** minutes.
2. The clock will be set at the server. The countdown timer at the top right corner of screen will display the remaining time available for you to complete the examination. When the timer reaches zero, the examination will end by itself. You need not terminate the examination or submit your paper.
3. Any useful data required for your paper can be viewed by clicking on the **Useful Data** button that appears on the screen.
4. Use the scribble pad provided to you for any rough work. Submit the scribble pad at the end of the examination.
5. You are allowed to use only your own **non-programmable calculator**.
6. The Question Palette displayed on the right side of screen will show the status of each question using one of the following symbols:



7. The **Marked for Review** status for a question simply indicates that you would like to look at that question again. *If a question is 'answered, but marked for review', then the answer will be considered for evaluation unless the status is modified by the candidate.*

Navigating to a Question :

8. To answer a question, do the following:
   a. Click on the question number in the Question Palette to go to that question directly.
   b. Select the answer for a multiple choice type question and for the multiple select type question. Use the virtual numeric keypad to enter the answer for a numerical type question.
   c. Click on **Save & Next** to save your answer for the current question and then go to the next question.
   d. Click on **Mark for Review & Next** to save and to mark for review your answer for the current question, and then go to the next question.

Caution: Note that your answer for the current question will not be saved, if you navigate to another question directly by clicking on a question number without saving the answer to the previous question.

9. You can view all the questions by clicking on the **Question Paper** button. This feature is provided, so that if you want you can just see the entire question paper at a glance.

Answering a Question :

10. Procedure for answering a multiple choice question (MCQ):
    a. Choose the answer by selecting only one out of the 4 choices (A,B,C,D) given below the question and click on the bubble placed before the selected choice.

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b. To deselect your chosen answer, click on the bubble of the selected choice again or click on the **Clear Response** button.

c. To change your chosen answer, click on the bubble of another choice.

d. To save your answer, you MUST click on the **Save & Next** button.

11. Procedure for answering a multiple select question (MSQ):

a. Choose the answer by selecting one or more than one out of the 4 choices (A,B,C,D) given below the question and click on the checkbox(es) placed before each of the selected choice (s).

b. To deselect one or more of your selected choice(s), click on the checkbox(es) of the choice(s) again. To deselect all the selected choices, click on the **Clear Response** button.

c. To change a particular selected choice, deselect this choice that you want to change and click on the checkbox of another choice.

d. To save your answer, you MUST click on the **Save & Next** button.

12. Procedure for answering a numerical answer type (NAT) question:

a. To enter a number as your answer, use the virtual numerical keypad.

b. A fraction (e.g. -0.3 or -.3) can be entered as an answer with or without '0' before the decimal point. As many as four decimal points, e.g. 12.5435 or 0.003 or -932.6711 or 12.82 can be entered.

c. To clear your answer, click on the **Clear Response** button.

d. To save your answer, you MUST click on the **Save & Next** button.

13. To mark a question for review, click on the **Mark for Review & Next** button. *If an answer is selected (for MCQ and MSQ types) or entered (for NAT) for a question that is* **Marked for Review***, that answer will be considered in the evaluation unless the status is modified by the candidate.*

14. To change your answer to a question that has already been answered, first select that question and then follow the procedure for answering that type of question as described above.

15. Note that ONLY those questions for which answers are ***saved*** or ***marked for review after answering*** will be considered for evaluation.

Choosing a Section :

16. Sections in this question paper are displayed on the top bar of the screen. All sections are compulsory.

17. Questions in a section can be viewed by clicking on the name of that section. The section you are currently viewing will be highlighted.

18. To select another section, simply click the name of the section on the top bar. You can shuffle between different sections any number of times.

19. When you select a section, you will only be able to see questions in this Section, and you can answer questions in the Section.

20. After clicking the **Save & Next** button for the last question in a section, you will automatically be taken to the first question of the next section in sequence.

21. You can move the mouse cursor over the name of a section to view the answering status for that section.

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JAM 2015 Examination

GG: Geology

Duration: **180 minutes** *Maximum Marks*: **100**

Read the following instructions carefully.

1. To login, enter your Registration Number and Password provided to you. Kindly go through the various coloured symbols used in the test and understand their meaning before you start the examination.
2. Once you login and after the start of the examination, you can view all the questions in the question paper, by clicking on the **Question Paper** button in the screen.
3. This test paper has a total of 60 questions carrying 100 marks. The entire question paper is divided into three **sections, A, B** and **C**. All sections are compulsory. Questions in each section are of different types.
4. **Section – A** contains **Multiple Choice Questions (MCQ)**. Each MCQ type question has four choices out of which only one choice is the correct answer. This section has 30 Questions and carry a total of 50 marks. Q.1 – Q.10 carry 1 mark each and Questions Q.11 – Q.30 carry 2 marks each.
5. **Section – B** contains **Multiple Select Questions (MSQ)**. Each MSQ type question is similar to MCQ but with a difference that there may be one or more than one choice(s) that are correct out of the four given choices. The candidate gets full credit if he/she selects all the correct choices only and no wrong choices. This section has 10 Questions and carry 2 marks each with a total of 20 marks.
6. **Section – C** contains **Numerical Answer Type (NAT)** questions. For these NAT type questions, the answer is a real number which needs to be entered using the virtual numerical keypad on the monitor. No choices will be shown for these type of questions. This section has 20 Questions and carry a total of 30 marks. Q.1 – Q.10 carry 1 mark each and Questions Q.11 – Q.20 carry 2 marks each.
7. Depending upon the JAM test paper, there may be useful common data that may be required for answering the questions. If the paper has such useful data, the same can be viewed by clicking on the **Useful Data** button that appears at the top, right hand side of the screen.
8. The computer allotted to you at the examination centre runs specialized software that permits only one choice to be selected as answer for multiple choice questions using a mouse, one or more than one choices to be selected as answer for multiple select questions using a mouse and to enter a suitable number for the numerical answer type questions using the virtual numeric keypad and mouse.
9. Your answers shall be updated and saved on a server periodically and also at the end of the examination. The examination will **stop automatically** at the end of **180 minutes**.
10. Multiple choice questions (Section-A) will have four choices against A, B, C, D, out of which only **ONE** choice is the correct answer. The candidate has to choose the correct answer by clicking on the bubble (○) placed before the choice.
11. Multiple select questions (Section-B) will also have four choices against A, B, C, D, out of which **ONE OR MORE THAN ONE** choice(s) is /are the correct answer. The candidate has to choose the correct answer by clicking on the checkbox (□) placed before the choices for each of the selected choice(s).
12. For numerical answer type questions (Section-C), each question will have a numerical answer and there will not be any choices**. For these questions, the answer should be entered** by using the mouse and the virtual numerical keypad that appears on the monitor.
13. In all questions, questions not attempted will result in zero mark. In **Section – A** (MCQ), wrong answer will result in **NEGATIVE** marks. For all 1 mark questions, 1/3 marks will be deducted for each wrong answer. For all 2 marks questions, 2/3 marks will be deducted for each wrong answer. In **Section – B** (MSQ), there is **NO NEGATIVE** and **NO PARTIAL** marking provisions. There is **NO NEGATIVE** marking in **Section – C** (NAT) as well.

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14. **Non-programmable calculators** are allowed but sharing of calculators is not allowed.

15. Mobile phones, electronic gadgets other than calculators, charts, graph sheets, and mathematical tables are **NOT** allowed in the examination hall.

16. You can use the scribble pad provided to you at the examination centre for all your rough work. The scribble pad has to be returned at the end of the examination.

Declaration by the candidate:

"I have read and understood all the above instructions. I have also read and understood clearly the instructions given on the admit card and shall follow the same. I also understand that in case I am found to violate any of these instructions, my candidature is liable to be cancelled. I also confirm that at the start of the examination all the computer hardware allotted to me are in proper working condition".

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SECTION – A

MULTIPLE CHOICE QUESTIONS (MCQ)

Q. 1 – Q.10 carry one mark each.

Q.1 Which amongst the following planets has the highest number of known satellites?

(A) Mars (B) Uranus (C) Venus (D) Mercury

Q.2 Identify the mineral which has specific gravity >5, hardness <3 and gives grey streak.

(A) Barite (B) Sphalerite (C) Graphite (D) Galena

Q.3 A unit which is semi-permeable and does not yield any significant quantity of groundwater is called:

(A) Aquiclude (B) Aquifer (C) Aquitard (D) Artesian Aquifer

Q.4 A sandstone with less than 15% matrix content is known as:

(A) Siltstone (B) Mudstone (C) Greywacke (D) Arenite

Q.5 Which of the following mineral deposit is formed exclusively by surface geological processes?

(A) Wollastonite (B) Asbestos (C) Corundum (D) Bauxite

Q.6 Graphic texture is indicative of:

(A) Eutectic crystallization
(B) Crystal settling
(C) Fractional crystallization
(D) Magma mixing

Q.7 Which of the following is NOT a form of the isometric system?

(A) Octahedron (B) Tetrahedron (C) Trapezohedron (D) Rhombohedron

Q.8 Which of the following group of fossils became extinct at the Permo-Triassic boundary?

(A) Graptolite (B) Trilobite (C) Ammonite (D) Ediacaran

Q.9 Arrange the following granitoid bodies in order of their decreasing age.

(P) Erinpura Granite
(Q) Closepet Granite
(R) Singhbhum Granite
(S) Ladakh Granitoids

(A) R-P-Q-S
(B) S-Q-R-P
(C) R-Q-P-S
(D) Q-R-S-P

Q.10 Which of the following Brachiopod genera is considered as “living fossil”?

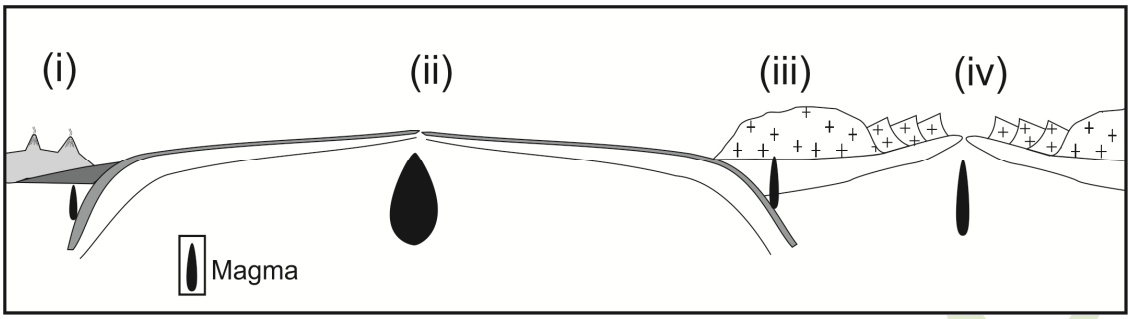
(A) *Lingula* (B) *Productus* (C) *Atrypa* (D) *Spirifer*

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Q. 11 – Q. 30 carry two marks each.

Q.11 In the given figure (i), (ii), (iii), and (iv) denote the plate tectonic settings: Mid Oceanic Ridge (M), Island Arc (I), Continental Arc (C) and Rift Zone (R).



Which one of the following options is correctly matched?

(A) (i) – M, (ii) – I, (iii) – C, (iv) – R
(B) (i) – R, (ii) – I, (iii) – M, (iv) – C
(C) (i) – I, (ii) – R, (iii) – M, (iv) – C
(D) (i) – I, (ii) – M, (iii) – C, (iv) – R

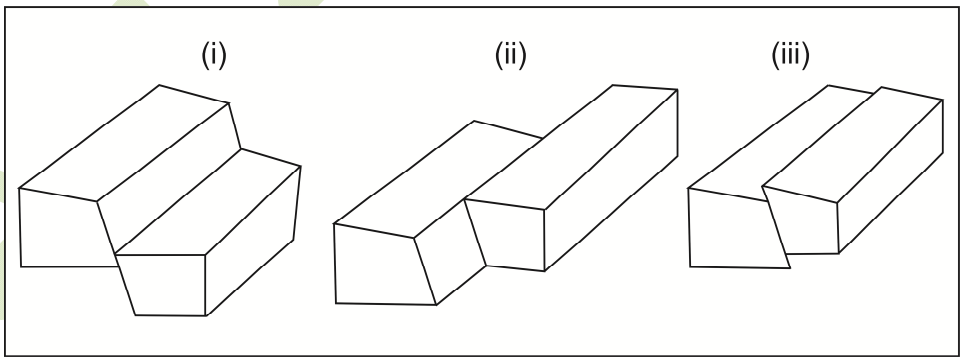
Q.12 In an undulated topography, a set of uniformly inclined beds show 'V'-shaped outcrop pattern with apex pointing downstream in a valley. This indicates:

(A) The dip of the beds is more than the slope of the valley
(B) The dip of the beds is less than the slope of the valley
(C) The beds are vertical
(D) The beds are horizontal

Q.13 Silica-rich viscous magmas often produce:

(A) Stratovolcano (B) Shield volcano (C) Dome (D) Fissure eruption

Q.14 Identify the faults in the diagrams (i), (ii), and (iii)



(A) (i) – Normal, (ii) – Dextral strike slip, (iii) – Reverse
(B) (i) – Normal, (ii) – Sinistral strike slip, (iii) – Reverse
(C) (i) – Reverse, (ii) – Dextral strike slip, (iii) – Normal
(D) (i) – Reverse, (ii) – Sinistral strike slip, (iii) – Normal

Q.15 A mine excavation made along the strike of a 2 meter thick tabular ore body dipping 30° is called:

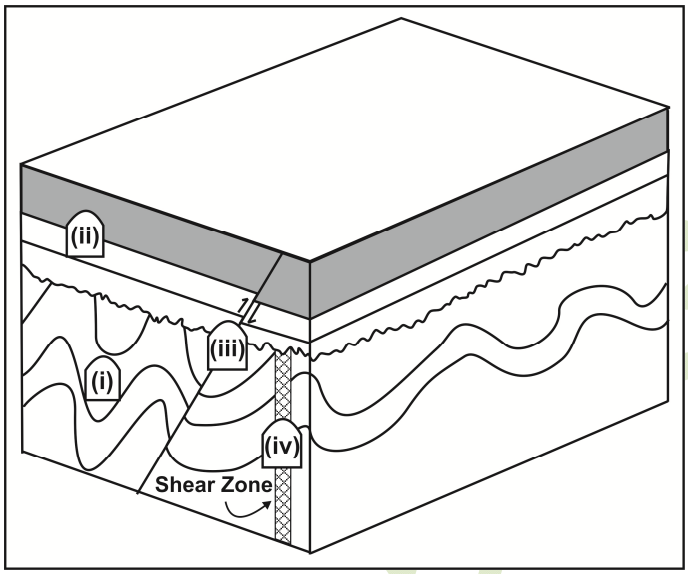
(A) Crosscut (B) Raise (C) Drive (D) Shaft

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Q.16 An ore body showing 'saddle reef' structure is formed by:

(A) Early magmatic crystallization process
(B) Liquid immiscibility
(C) Hydrothermal process
(D) Metamorphic process

Q.17 In the given block diagram, select the most suitable site amongst (i), (ii), (iii), and (iv) for constructing a tunnel.



(A) (i) (B) (ii) (C) (iii) (D) (iv)

Q.18 Match the metals listed in **Group-I** with their ores in **Group-II**

Group – I	**Group – II**
(i) Tin	(P) Scheelite
(ii) Tungsten	(Q) Pyrolusite
(iii) Copper	(R) Cassiterite
(iv) Manganese	(S) Bornite

(A) (i) – R, (ii) – P, (iii) – S, (iv) – Q
(B) (i) – Q, (ii) – P, (iii) – S, (iv) – R
(C) (i) – R, (ii) – Q, (iii) – P, (iv) – S
(D) (i) – P, (ii) – S, (iii) – R, (iv) – Q

Q.19 Which one of the following minerals is correctly matched with its optical property?

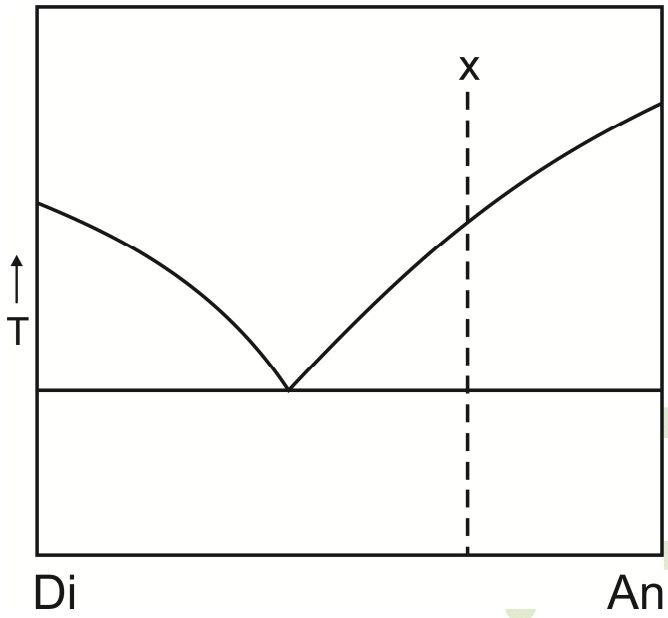
(A) Sillimanite – Isotropic
(B) Orthoclase – High relief
(C) Pyroxene – Nearly orthogonal cleavage
(D) Garnet – Lamellar twinning

Q.20 The mineral coesite is expected to be stable in which of the following metamorphic facies?

(A) Greenschist (B) Blueschist (C) Eclogite (D) Granulite

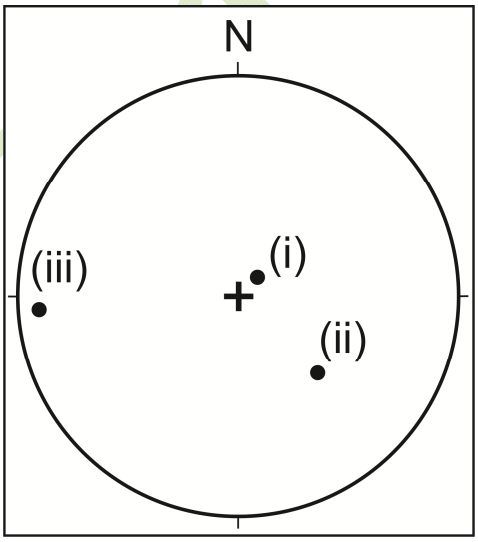
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Q.21 In the given phase diagram, the sequence of minerals crystallizing from a magma of composition "X" under equilibrium conditions is:



(A) An→ Di (B) An→ An + Di (C) Di→ An (D) Di→ Di + An

Q.22 In the given stereo plot, poles to three bedding planes are plotted as points (i), (ii) and (iii). Find the correct order of increasing dips of the beds.



(A) (i) – (ii) – (iii) (B) (i) – (iii) – (ii) (C) (ii) – (i) – (iii) (D) (iii) – (i) – (ii)

Q.23 Size of a kettle lake depends upon:

(A) Size of the sediment carried by the glacier
(B) Width of the glacier valley
(C) Height of the valley through which the glacier moves
(D) Size of the buried ice block within moraines

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Q.24 Match the sedimentary rocks given in **Group-I** with their characteristics in **Group-II**

Group – I	**Group – II**
(i) Sandstone	(P) Chemical sediment
(ii) Arkose	(Q) Grain size 1/16 – 2 mm
(iii) Limestone	(R) Feldspar-rich
(iv) Shale	(S) Grain size < 1/16 mm

(A) (i) – R, (ii) – P, (iii) – S, (iv) – Q
(B) (i) – Q, (ii) – R, (iii) – P, (iv) – S
(C) (i) – Q, (ii) – R, (iii) – S, (iv) – P
(D) (i) – P, (ii) – S, (iii) – R, (iv) – Q

Q.25 Arrange the following formations of the Gondwana Supergroup in order of their decreasing age:

(i) Raniganj Formation
(ii) Barakar Formation
(iii) Kulti Formation
(iv) Karharbari Formation

(A) (i) – (iii) – (ii) – (iv)
(B) (i) – (ii) – (iii) – (iv)
(C) (iv) – (iii) – (ii) – (i)
(D) (iv) – (ii) – (iii) – (i)

Q.26 Match the Lamellibranchia genera in **Group-I** with their dentition pattern in **Group-II**

Group – I	**Group – II**
(i) *Glycimeris*	(P) Schizodont
(ii) *Trigonia*	(Q) Taxodont
(iii) *Lucina*	(R) Dysodont
(iv) *Mytilus*	(S) Heterodont

(A) (i) – Q, (ii) – P, (iii) – S, (iv) – R
(B) (i) – P, (ii) – Q, (iii) – R, (iv) – S
(C) (i) – Q, (ii) – P, (iii) – R, (iv) – S
(D) (i) – S, (ii) – R, (iii) – Q, (iv) – P

Q.27 Drainage density of a basin is defined as:

(A) Sum of the number of streams of all orders divided by the area of the basin
(B) Total length of streams of all orders divided by the area of the basin
(C) Total number of the highest order streams divided by the total number of the next lower order streams
(D) Length of the largest stream divided by the area of the basin

Q.28 S- wave is terminated at:

(A) Crust—Mantle boundary
(B) Lithosphere—Asthenosphere boundary
(C) Mantle—Core boundary
(D) Inner and Outer core boundary

Q.29 Arrange the elements Fe, O, H, He, Si in decreasing order of their abundance in the solar system.

(A) H > He > O > Si > Fe
(B) He > H > Si > O > Fe
(C) H > He > O > Fe > Si
(D) Si > Fe > H > He > O

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Q.30 A dolerite dyke metamorphosed under amphibolite facies condition is expected to have the mineral assemblage:

(A) Chlorite + Actinolite + Albite
(B) Lawsonite + Glaucophane + Epidote
(C) Orthopyroxene + Clinopyroxene + Plagioclase
(D) Hornblende + Plagioclase

SECTION - B

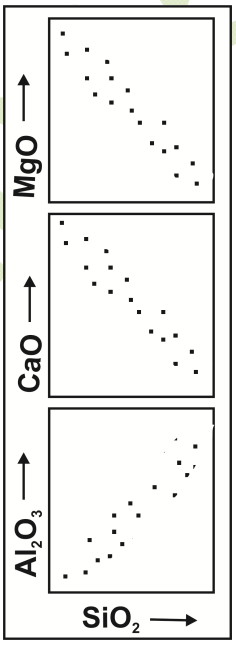
MULTIPLE SELECT QUESTIONS (MSQ)

Q. 1 – Q. 10 carry two marks each.

Q.1 A pyrite-chalcopyrite-bearing copper ore body has undergone supergene enrichment. Choose the correct statement(s).

(A) Limonite is present in the gossan zone
(B) Cuprite is present in the zone of oxidation
(C) Chalcocite is present in the zone of supergene enrichment
(D) Malachite is present in the primary zone

Q.2 The geochemical trends illustrated in the diagrams for a suite of cogenetic and coeval igneous rocks indicate:



(A) Olivine crystallization
(B) Clinopyroxene crystallization
(C) Plagioclase crystallization
(D) Alkali feldspar crystallization

Q.3 Which of the following chronostratigraphic unit(s) is/are correctly matched with the corresponding geochronologic unit(s)?

(A) System—Period
(B) Stage—Era
(C) Series—Epoch
(D) Chronozone—Age

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Q.4 Which of the following statements related to depositional environments is/are correct?

(A) Herringbone cross-stratification indicates glacio-fluvial environment
(B) Dune is characterized by the presence of finer-grains at the top and coarser-grains at the bottom
(C) Dropstone is of glacial origin
(D) Bouma sequence indicates turbidite deposit

Q.5 Which of the following fossil genera is/are invertebrate?

(A) *Megalodon*
(B) *Spondylus*
(C) *Stegodon*
(D) *Telemastodon*

Q.6 Which of the following trilobites have two to four thoracic segments and are eyeless?

(A) *Agnostus*
(B) *Olenellus*
(C) *Calymene*
(D) *Microdiscus*

Q.7 Which of the following formation(s) was/were deposited in glacial and/or fluvial environment?

(A) Subathu Formation
(B) Karewa Formation
(C) Indus Formation
(D) Blaini Formation

Q.8 Which of the following statements is/are correct?

(A) Rajpura-Dariba in Rajasthan is a working Pb-Zn deposit
(B) Iron ore is mined in Noamundi, Odisha
(C) The largest copper mine in India is located in Malanjkhand, Madhya Pradesh
(D) Manganese deposit is found in the Mansar Formation, Maharashtra

Q.9 Which of the following stratigraphic units are correctly matched with their ages and geographical localities?

(A) Niniyur Formation – Cretaceous – Cauvery basin
(B) Long Formation – Oligocene – Andaman-Nicobar
(C) Zewan Formation – Permian – Kashmir-Lidar valley
(D) Bhander Group – Early Proterozoic – Vindhyan basin

Q.10 Petroleum producing basins of India belong to:

(A) Cambrian (B) Cretaceous (C) Tertiary (D) Quaternary

SECTION – C

NUMERICAL ANSWER TYPE (NAT)

Q. 1 – Q. 10 carry one mark each.

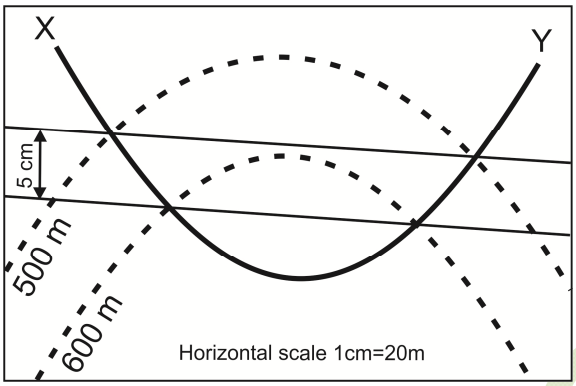
Q.1 On a toposheet of 1:50,000 scale, the distance between upper and lower traces of a bed is 5 cm. The actual distance on ground in kilometers is_____.

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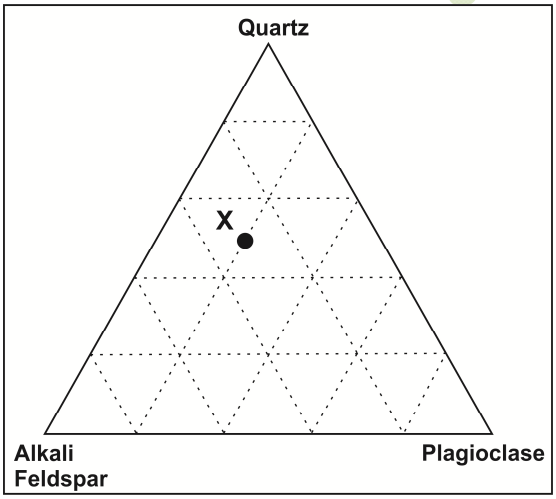
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Q.2 On a flat topography the outcrop width of a bed is 30m. If the true dip of the bed is 30°, the actual thickness of the bed in meters is_____.

Q.3 In the given map, the true dip (in degree) of the bedding plane X-Y is_____.

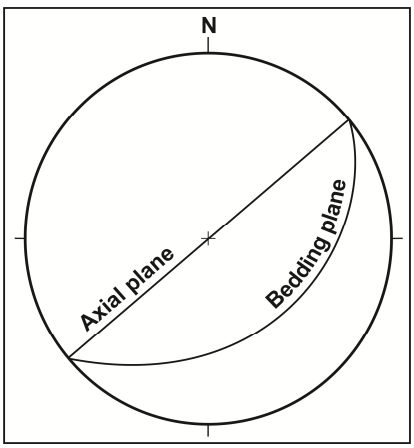


Q.4 In the given diagram, the percentage of Plagioclase in a rock of composition 'X' is_____.



Q.5 The birefringence of a uniaxial mineral having refractive indices of 1.658 and 1.486 is_____.

Q.6 In the given stereoplot, the plunge amount of the fold axis is_____.



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Q.7 A crystal face has the following intercepts for the crystallographic axes: $1a_1$, $1a_2$, $\frac{1}{2}a_3$, ∞c. The Miller-Bravais indices for the face is_____.

Q.8 Total number of mirror planes in the $\frac{4}{m}\ \bar{3}\ \frac{2}{m}$ point group is_____.

Q.9 A radioactive isotope has 1024 atoms. How many atoms will remain after 4 half-lives?

Q.10 Waste water discharged from a coal mine has hydrogen ion [H^+] concentration of 10^{-6} moles/liter. The pH of the water is_____.

Q. 11 – Q. 20 carry two marks each.

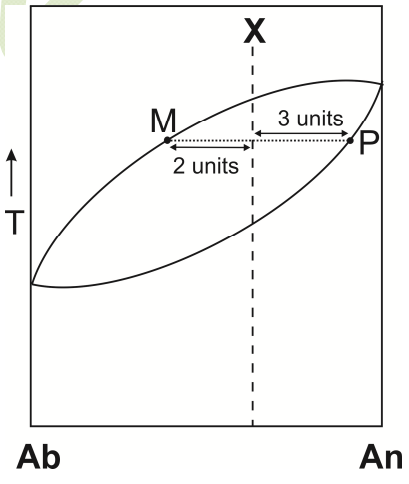
Q.11 An ore body is dipping 30° towards west on a flat topography. At what distance (in meters) should a borehole be placed so that it intersects the ore body perpendicularly at a vertical depth of 70 meters?

Q.12 Using the phase rule, the maximum number of phases in a 3 (three) component geological system having 1 (one) degree of freedom is_____.

Q.13 The lithostatic pressure in Mega Pascal (MPa) at a depth of 10 km in a granite batholith having density 2700 kg/m^3 is_____.

(Acceleration due to gravity = 9.8 m/s^2)

Q.14 In the given phase diagram, the weight percent of melt at point 'M' for a crystallizing magma of bulk composition 'X' is_____.



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Q.15 Calculate the average atomic weight (answer to be given up to 3 decimal places) of Rubidium using the given data.

Isotope	Abundance (%)	Atomic weight (a.m.u.)
^{85}Rb	72.17	84.912
^{87}Rb	27.83	86.909

Q.16 In an oblique slip fault having 30° dip, the net slip is 10 meters at an angle of 45° to the strike of the fault plane. The dip slip component of the fault in meters is_____.
(Answer to be given up to 2 decimal places).

Q.17 A 10 cm^3 sandstone block has a mass of 20 grams. If the average density of sand grains is 2.5 g/cm^3, the porosity (in percent) of the sandstone is_____.

Q.18 A mineral has a weight of 4.5 grams in air and 3.2 grams in water. Assuming density of water to be 1g/cm^3, the specific gravity (up to 2 decimal places) of the mineral is_____.

Q.19 The duration of the Proterozoic Eon in Ma is_____.

Q.20 From the given equation, calculate how many moles of magnetite will be produced by the reduction of 1 (one) mole of hematite (answer to be given up to 3 decimal places).

$$\mathbf{6Fe_2O_3 \rightarrow 4Fe_3O_4 + O_2}$$

END OF THE QUESTION PAPER

JAM 2015 : GG

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Answer Keys are given below for all Codes of this subject paper. Please Scroll Down

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JAM 2015

Answer Keys for the Test Paper: Geology (GG)

Section A - MCQ Multiple Choice Questions			Section B - MSQ Multiple Select Questions			Section C - NAT Numerical Answer Type Questions		
Q. No.	Key	Marks	Q. No.	Key	Marks	Q. No.	Range	Marks
1	B	1	1	A;B;C	2	1	2.5 to 2.5	1
2	D	1	2	A;B	2	2	15 to 15	1
3	C	1	3	A;C	2	3	45 to 45	1
4	D	1	4	C;D	2	4	20 to 20	1
5	D	1	5	A;B	2	5	0.172 to 0.172	1
6	A	1	6	A;D	2	6	0 to 0	1
7	D	1	7	B;D	2	7	1120 to 1120	1
8	B	1	8	A;B;C;D or A;C;D	2	8	9 to 9	1
9	C	1	9	A;C	2	9	64 to 64	1
10	A	1	10	B;C	2	10	6 to 6	1
11	D	2				11	161.63 to 161.67	2
12	A	2				12	4 to 4	2
13	C	2				13	264.5 to 264.7	2
14	B	2				14	60 to 60	2
15	C	2				15	85.464 to 85.470	2
16	C	2				16	7.07 to 7.07	2
17	B	2				17	20 to 20	2
18	A	2				18	3.46 to 3.46	2
19	C	2				19	1900 to 2000	2
20	C	2				20	0.666 to 0.667	2
21	B	2						
22	A	2						
23	D	2						
24	B	2						
25	D	2						
26	A	2						
27	B	2						
28	C	2						
29	A	2						
30	D	2						