PROVISIONAL ANSWER KEY

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Question1:-Streams which flow in the opposite direction to the main stream are described as

A:-Obsequent streams

B:-Resequent streams

C:-Subsequent streams

D:-Insequent streams

Correct Answer:- Option-A

Question2:-Which of the following aeolian processes is the most important for the formation of yardangs ?

A:-Concreation

B:-Attrition

C:-Deflation

D:-Abration

Correct Answer:- Option-C

Question3:-The Western Ghats in Kerala are an example of which type of landform ?

A:-Residual hills

B:-Block mountains

C:-Fold mountains

D:-Volcanic mountains

Correct Answer:- Option-B

Question4:-Which of the following sources are most likely to have low Dissolved Oxygen (DO) levels ?
i. Stagnent pond
ii. Rapidly flowing water
iii. Deep underground well
iv. Eutrophic lake
Choose the correct appropriate answer.

A:-i, iii and iv only

B:-i and iii only

C:-i, ii and iii only

D:-ii and iii only

Correct Answer:- Option-A

Question5:-Which soil horizon is known as the "zone of leaching" where minerals are washed out ?

A:-O-horizon

B:-A-horizon

C:-B-horizon

D:-C-horizon

Correct Answer:- Option-B

Question6:-Which one of the following statements is/are correct ?
i. Strength of a rock increases with increase in confining pressure.
ii. Strength of a rock decreases with increase in temperature.
iii. Strength of a rock increases with increase in strain.
iv. Strength of a rock increases with increase in pore water pressure.

A:-i and ii only

B:-i and iii only

C:-ii and iii only

D:-i and iv only

Correct Answer:- Option-A

Question7:-Which type of rotational symmetry is not allowed in crystal structure ?

A:-2-fold

B:-3-fold

C:-5-fold

D:-6-fold

Correct Answer:- Option-C

Question8:-Which Bravais lattice belongs to the highest symmetry class ?

A:-Simple cube

B:-Face-centred cube

C:-Body-centred tetragonal

D:-Primitive monoclic

Correct Answer:- Option-B

Question9:-Interference colour of a mineral section is maximum in the plane

A:-Perpendicular to the optic axis

B:-Parallel to the optic axis

C:-At 45° to the optic axis

D:-At 60° to the optic axis

Correct Answer:- Option-A

Question10:-The important factor affecting the atomic substitution is

A:-Valency of the atom

B:-Ionic size

C:-Charge of the ion

D:-E.N. Difference between atoms

Correct Answer:- Option-B

Question11:-The myrmekite structure is an inter growth between

A:-Orthoclase and plagioclase

B:-Plagioclase and quartz

C:-Plagioclase and vermicular quartz

D:-Orthoclase and quartz

Correct Answer:- Option-C

Question12:-Which of the following directional structures are best for the study of a turbidite basin ?

A:-Ripple lamination

B:-Flute marks

C:-Scours

D:-Cross bedding

Correct Answer:- Option-B

Question13:-A spotted appearance in metamorphic rocks that's caused by the formation of large crystals called porphyroblasts

A:-Maculose structure

B:-Flase structure

C:-Mortar structure

D:-Myrmekitic structure

Correct Answer:- Option-A

Question14:-Palingenesis is a process shown to start at a temperature of about

A:-1500°C

B:-1000°C

C:-800°C

D:-500°C

Correct Answer:- Option-A

Question15:-Which one of the following is not a set of polymorphous mineral ?

A:-calcite, aragonite, vaterite

B:-Quartz, coesite, trydimite

C:-Graphite, anthracite, diamond

D:-Kayanite, sillimanite, andalusite

Correct Answer:- Option-C

Question16:-Which of the following sedimentary structure cannot be identified in vertical sections ?

A:-Convelute lamination

B:-Gutter cast

C:-Dish structure

D:-Skip marks

Correct Answer:- Option-D

Question17:-Which of the metamorphic facies is characterized by the pyrope rich garnet + omphacite assemblage ?

A:-Eclogite facies

B:-Blueschist facies

C:-Greenschist facies

D:-Granulite facies

Correct Answer:- Option-A

Question18:-The correct pair of naturally occurring fossil isotope of Uranium is

A:-U^{236} and U^{237}

B:-U^{235} and U^{236}

C:-U^{235} and U^{238}

D:-U^{236} and U^{238}

Correct Answer:- Option-C

Question19:-Quartz can be optically easily distinguished from nepheline based on

A:-Birefringence

B:-Relief

C:-Extinction angle

D:-Optic sign

Correct Answer:- Option-D

Question20:-An igneous texture showing mesh-work of feldspar laths with gaps filled by glass is known as

A:-Seriate

B:-Intersertal

C:-Intergranular

D:-Trachytic

Correct Answer:- Option-B

Question21:-What are the major products of the coalification process ?

A:-Coal-bed methane, oxygen and nitrogen

B:-Carbon dioxide, hydrogen and sulfur dioxide

C:-Coal-bed methane, carbon dioxide, nitrogen and water

D:-Methane, hydrogen sulfide and water

Correct Answer:- Option-C

Question22:-How is the ground energized in a pure Electromagnetic method of geophysical exploration ?

A:-By applying Direct Current (DC) into the ground

B:-By applying static magnetic fields

C:-By an alternating current flowing in a transmitter coil

D:-None of the above

Correct Answer:- Option-C

Question23:-What is the primary purpose of Ground Penetrating Radar (GPR) in geological studies ?

A:-To measure the Earth's magnetic field

B:-To identify concealed mineral bodies and map stratigraphy

C:-To determine the chemical composition of minerals

D:-To measure Earth's gravity field

Correct Answer:- Option-B

Question24:-Which of the following correctly describes the adsorption of Coal Bed Methane (CBM) in coal ?

A:-CBM is adsorbed as solid particles in the coal matrix

B:-CBM is adsorbed in non-carbonaceous minerals present in coal

C:-CBM is adsorbed in the fractures and joints of the coal

D:-CBM is adsorbed as molecules on the organic surface of the coal

Correct Answer:- Option-D

Question25:-Which of the given statement is true for aluminous laterite ?

A:-Laterite with $Fe_2\ O_3$: Al_2O_3 ratio more than one and SiO_2:Fe_2O_3 ratio less than 1.33

B:-Laterite with $Fe_2\ O_3$: Al_2O_3 ratio less than one and SiO_2:Al_2O_3 ratio less than 1.33

C:-Laterite with $Fe_3\ O_4$: Al_2O_3 ratio more than one and SiO_2:Fe_2O_3 ratio less than 1.33

D:-Laterite with SiO_2:$Al_2\ O_3$ ratio more than one and SiO_2:Fe_2O_3 ratio less than 1.33

Correct Answer:- Option-B

Question26:-What is the primary process responsible for salt formation in sabkhas ?

A:-Capillary evaporation from a saline water table

B:-Precipitation from rainwater

C:-Deposition by river flooding

D:-Deposition from ocean water

Correct Answer:- Option-A

Question27:-Refractory clay exhibits incipient melting at temperatures above 1580°C due to the presence of

A:-High silica (SiO_2) content

B:-Elevated aluminum oxide (Al_2O_3) content

C:-High iron oxide (Fe_2O_3) content

D:-Excessive carbon (C) content

Correct Answer:- Option-B

Question28:-In the ore dressing process, the property of fluorescence is utilized for which of the following mineral(s) ?
i. Feldspar
ii. Uranium minerals
iii. Scheelite

A:-Only i and iii

B:-Only iii

C:-Only ii and iii

D:-All of the above (i, ii and iii)

Correct Answer:- Option-C

Question29:-Complex gas hydrates are more stable than simple methane hydrate because they contain additional guest molecules such as

A:-Carbon monoxide and nitrogen

B:-Isobutane, propane and cyclopentane

C:-Oxygen and neon

D:-Sodium chloride and calcium carbonate

Correct Answer:- Option-B

Question30:-Which of the following statements is correct regarding skarn deposits ?

A:-Skarn is an association of calcium bearing iron rich silicate

B:-Skarn is an association of calcium bearing iron poor silicate

C:-Skarn is an association of calcium bearing iron rich carbonate

D:-Skarn is an association of calcium bearing iron poor oxide

Correct Answer:- Option-A

Question31:-The term "taconite" is applied to which of the following statements ?

A:-Banded Iron formation dominated by siderite, limonite and chert

B:-Banded Iron Formation dominated by jasper, pyrite and chert

C:-Banded Iron Formation dominated magnetite, iron silicates and chert

D:-Banded Iron Formation dominated limonite, kaolinite and chert

Correct Answer:- Option-C

Question32:-The process of elutriation is associated with the formation of

A:-Eluvial placers

B:-Replacement deposits

C:-Supergene deposits

D:-Stream and Beach placers

Correct Answer:- Option-D

Question33:-Which of the following statements are true for phosphorites ?
i. Phosphate rich sedimentary rock.
ii. Deposit containing more than 15 to 20% P_2O_5.
iii. Forms on continental shelf environment.
iv. Product of sub marine volcanism.

A:-i, ii and iii only

B:-i and ii only

C:-i and iv only

D:-iii and iv only

Correct Answer:- Option-A

Question34:-Which are the manganese minerals that are deposited as concentric layers in a manganese nodule ?

A:-Rhodochrosite and Smithsonite

B:-Manganite and Braunite

C:-Rhodonite and Psilomelane

D:-Pyrolusite and birnesite

Correct Answer:- Option-D

Question35:-Which of the following metal ores is not typically associated with ultramafic rocks ?

A:-Platinum

B:-Chromium

C:-Copper

D:-Nickel

Correct Answer:- Option-C

Question36:-A fertile pegmatite melt is characterized by

A:-Low amounts of volatiles and rare elements

B:-High amounts of volatiles and incompatible elements

C:-High density and low silica content

D:-Lack of any residual melt components

Correct Answer:- Option-B

Question37:-In mineralogic zoning of an ideal VMS ore, which mineral assemblage is found in the massive ore body ?

A:-Pyrite-Chalcopyrite

B:-Pyrrhotite-Chalcopyrite

C:-Pyrite-Sphalerite-Galena

D:-Magnetite-Hematite

Correct Answer:- Option-A

Question38:-The disseminated graphite in the Khondalite rocks of Kerala is primarily arranged along which geological structure ?

A:-Bedding planes

B:-Cleavage planes

C:-Foliation planes

D:-Joint planes

Correct Answer:- Option-C

Question39:-Which of the following conditions are referred to as Sedimentary-Exhalative (SEDEX) type ore deposits ?
i. Proximal position to submarine volcanoes.
ii. More distal positions where only sparse ash layers in the sedimentary column point to synchronous volcanism.
iii. Purely sedimentary settings.

A:-Only i and ii

B:-Only ii and iii

C:-Only i and iii

D:-All of the above (i, ii and iii)

Correct Answer:- Option-B

Question40:-What is a key characteristic of a Metallogenetic Province ?

A:-It includes ore deposits formed in a major geotectonic unit during one geodynamic cycle

B:-It contains only a single type of mineral deposit

C:-It covers a smaller area compared to a mining district

D:-It forms exclusively in Archean cratons

Correct Answer:- Option-A

Question41:-You are provided with the following information from three different sources about a geological outcrop:
Source 1 :A stratigraphic column shows a sequence of layers from bottom to top : sandstone, shale, limestone and basalt.
Source 2 : Radiometric dating indicates the basalt layer is 50 million years old, while the limestone below it is 60 million years old.
Source 3 : Fossil evidence from the shale layer matches organisms that lived approximately 65 million years ago.
Based on these sources, which of the following statements is most accurate ?

A:-The basalt layer is the oldest because it is at the top of the sequence

B:-The principle of superposition suggests the sandstone is the oldest layer

C:-The shale layer must be older than the limestone based on fossil evidence

D:-The basalt and limestone layers are the same age according to radiometric dating

Correct Answer:- Option-B

Question42:-What is a map ?

A:-A tool used to measure height of an elevated surface on earth

B:-A two dimensional diagram that represents the Earth or part of Earth's surface

C:-A device used for inclination of stratification

D:-A chart that shows monthly rainfall

Correct Answer:- Option-B

Question43:-An unconformity is

A:-A surface of erosion or non-deposition or both as detected in a sequence of rock

B:-A layer of boulders of pebbles in sequence of rocks

C:-A layer of clay or shale in igneous body

D:-None of the above

Correct Answer:- Option-A

Question44:-The type of joint commonly observed in granitic rocks, where three sets of joints occur at mutually right angles one horizontal and two vertical is called

A:-Columnar joint

B:-Conjugate joint

C:-Mural joint

D:-Sheet joint

Correct Answer:- Option-C

Question45:-The Warkalli Formation, which is distributed along the coastal regions of Kanhangad, Nileswaram, Nadayara and Varkala in Kerala characterized by carbonaceous shale, sandstone and thin seams of lignite. This formation is a part of Kerala's

A:-Quarternary sedimentary sequence

B:-Tertiary sedimentary sequence

C:-Cretaceous sequence

D:-Palaeo-proterozoic sequence

Correct Answer:- Option-B

Question46:-Stalactites and stalagmites are formed due to which of the following processes ?

A:-Stream erosion in limestone regions caused by specific chemical reactions

B:-Marine erosion and deposition along coastal regions due to wave action

C:-Groundwater deposition in caves through precipitation from dripping water rich in dissolved calcium carbonate

D:-All of the above

Correct Answer:- Option-C

Question47:-The quantity of water that a unit volume of aquifer drains by gravity is known as

A:-Porosity

B:-Permeability

C:-Hydraulic conductivity

D:-Specific yield

Correct Answer:- Option-D

Question48:-Which of the following statements correctly describe Darcy's Law ?

A:-The rate of groundwater flow through a column of saturated sand is directly proportional to the difference in hydraulic head at the ends of the column

B:-The rate of groundwater flow through a column of saturated sand is inversely proportional to the length of the column

C:-Darcy's law is expressed as $V = K \times I$, where V is specific discharge, K is hydraulic conductivity and I is the hydraulic gradient

D:-All of the above

Correct Answer:- Option-D

Question49:-The concept of sea floor spreading was proposed by

A:-Harry H. Hess

B:-Alfred Wegener

C:-Abraham Ortelius

D:-Tuzo Wilson

Correct Answer:- Option-A

Question50:-While most divergent boundaries occur at mid-oceanic ridges, some are found within continents. Which of the following is an example of a continental divergent boundary ?

A:-Himalayan Mountain Range, India-China boundary

B:-Great Rift Valley of East Africa, Red Sea and Dead Sea

C:-Andes Mountain Range, Chi-lie and Peru

D:-Mariana Trench, Japan

Correct Answer:- Option-B

Question51:-The critical diameter of an explosive is defined as the diameter below which it

A:-develops the optimum velocity of detonation

B:-does not involve in chemical reaction

C:-develops the maximum velocity of detonation

D:-deflagrates

Correct Answer:- Option-D

Question52:-Which of the following explosive is more oxygen balanced ?

A:-PETN[$C_5H_8N_4O_{12}$]

B:-Nitroglycerin [$C_3H_5N_3O_9$]

C:-Ammonium Nitrate [NH_4NO_3]

D:-TNT[$CH_3C_6H_2(NO_2)3$]

Correct Answer:- Option-C

Question53:-Match the following for a drilling system.

Component	Function
P. Drill	1. Utilization of energy in fragmenting rock
Q. Drill rod	2. Reduction of energy loss due to regrinding
R. Drill bit	3. Conversion of original form of energy into mechanical energy
S. Flushing medium	4. Transmission of energy from prime mover to applicator

A:-P–3, Q–1, R–2, S–4

B:-P–4, Q–1, R–3, S–2

C:-P–3, Q–4, R–1, S–2

D:-P–2, Q–1, R–3, S–4

Correct Answer:- Option-C

Question54:-Low shock and high gas pressure explosive is generally used for blasting of

A:-Hard and brittle rock mass

B:-Soft and jointed rock mass

C:-Hard and massive intact rock mass

D:-Soft and massive intact rock mass

Correct Answer:- Option-B

Question55:-Identify the initiation sequence which is not possible for surface blasting.

A:-Detonating fuse → Nonel→Electronic detonator

B:-Electric detonator→Nonel →Detonating fuse

C:-Electric detonator→Detonating fuse→Nonel

D:-Electronic detonator→ Detonating fuse→Nonel

Correct Answer:- Option-A

Question56:-20 plain detonators in series, each of 2Ω resistance, are fired by a DC exploder supplying a current of 1.25A. If 250 mJ energy is spent to fire the detonators, the time required in millisecond after detonator initiation is

A:-4

B:-8

C:-12

D:-16

Correct Answer:- Option-A

Question57:-The backsight reading on a bench mark of RL 100.0 m is 1.45 m. If the inverse staff reading on a foresight is 2.23m, the RL of the staff station in m is

A:-105.13

B:-103.68

C:-100.78

D:-98.55

Correct Answer:- Option-B

Question58:-GPS atomic clocks run faster due to the reduced gravitational pull (g/4) but slower due to the high rotational speed of the satellite. Considering these effects, compared to clocks on earth GPS atomic clocks are

A:-faster by 38.5 μs

B:-slower by 38.5 μs

C:-faster by 45.7 μs

D:-slower by 45.7 μs

Correct Answer:- Option-A

Question59:-The principle used for measuring distances electronically is that the difference in phase between the transmitted and received waves represents

A:-Only a fraction of wavelength

B:-Half wavelength

C:-One-fourth of wavelength

D:-One-third of wavelength

Correct Answer:- Option-A

Question60:-A total station can measure

A:-Distances electronically

B:-Horizontal angles accurately

C:-Vertical angles and distances

D:-Horizontal and vertical angles and distances

Correct Answer:- Option-D

Question61:-Theory of probability is applied to

A:-Accidental errors only

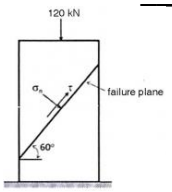
B:-Cumulative errors only

C:-Both accidental and cumulative

D:-None of the above

Correct Answer:- Option-A

Question62:-In a uniaxial compressive strength test, a cylindrical rock sample of diameter 50 mm fails at an angle of 60° as shown in the figure. If the peak load at failure is 120 kN, the normal and shear stresses on failure plane respectively, in MPa are _____ and _____.



A:-15.28 and 26.46

B:-26.46 and 15.28

C:-57.02 and –15.28

D:-–15.28 and 15.28

Correct Answer:- Option-A

Question63:-Coal pillar strength is represented by S = $s_1 h^{\alpha} w^{\beta}$ where s_1= insitu strength of the pillar,
h = mining height and w = pillar width. Two bord and pillar panels are developed in the similar geological conditions at depths D_1 and D_2 with mining heights $h_1$and h_2 respectively. If the gallery width and the pillar width in both the panels remain the same, the ratio of pillar safety factors, SF_1 /SF_2

A:-$\left(\frac{h_2}{h_1}\right)^{\alpha} \frac{D_1}{D_2}$

B:-$\left(\frac{h_2}{h_1}\right)^{\alpha} \frac{D_2}{D_1}$

C:-$\left(\frac{h_1}{h_2}\right)^{\alpha} \frac{D_1}{D_2}$

D:-$\left(\frac{h_1}{h_2}\right)^{\alpha} \frac{D_2}{D_1}$

Correct Answer:- Option-D

Question64:-A series of tri-axial compression tests conducted on sandstone samples reveal the following relationship between major and minor principal stresses σ_1 =50+$3\sigma_3$ [stresses are in MPa]. The cohesion in MPa and angle of internal friction in degrees of sandstone respectively are

A:-14.43, 30.0

B:-14.43, 60.0

C:-0.21, 73.9

D:-0.21, 16.1

Correct Answer:- Option-A

Question65:-Find the average ore sampling grade from one channel sampling results :
Sample1-25 cm @ 3.2%
Sample2-45 cm @ 2.2%
Sample3-10 cm @ 3.1%
Mining stopping width is 1m, cut-off grade is 2%

A:-2.625%

B:-2.1%

C:-2.7%

D:-2.55%

Correct Answer:- Option-B

Question66:-Which of the following statement is incorrect for stripping ratio ?

A:-The cut-off stripping ratio is the one for which the costs of mining the ore and waste are matched by the revenue from that block of ore

B:-The instantaneous stripping ratio is the stripping ratio for a given push back, where a tiny slice of material, i.e., ore and/or waste, is removed from a pit wall

C:-Increasing SR method produces low cash-flow in the initial period and covers the risk

D:-The maximum allowable stripping ratio is significant because it is purely economic ratio and determines the pit limit at current economic scenario

Correct Answer:- Option-C

Question67:-Which is not acceptable as per DGMS guideline for height and width of haul road ?

A:-No road shall have gradient more than 1 in 16

B:-No road shall be of width less than three time plus 5m width of the largest Vehicle playing on road

C:-All corner and bends shall be made in such a way that operator of vehicle have clear view of distance of not less than 3 times the breaking distance of largest HEMM working at 40 Km/hour

D:-Where any road existing above level of surrounding area it shall be provided with strong parapet wall/embankment having dimensions of width at top-not less than 0.5 m, width at bottom-not less than 2m, the height more than diameter of tyre of largest vehicle plying on road

Correct Answer:- Option-D

Question68:-In an underground coal mine, the output from the panel is 400 tonnes/day, having 25 days of working in a month where incubation period of coal is 6 months. If recovery from the panel is 80% and pillar size is 30m × 30m, height of 3m, specific gravity of coal of 1.4. Find out the number of pillars in the panel.

A:-22

B:-19

C:-15

D:-30

Correct Answer:- Option-B

Question69:-What is the permissible peak particle velocity as per the DGMS Cir. (Tech.)7/1997 for the Industrial buildings (RCC and framed structures) belonging to owners at frequency higher than 25 Hz ?

A:-5mm/sec.

B:-15mm/sec.

C:-25mm/sec.

D:-50mm/sec.

Correct Answer:- Option-D

Question70:-Which of the following statement is incorrect ?
i. In very thin to thin deposits (up to 2 m thickness) in order to provide working space for the man and machines, floor stripping in the country rocks becomes essential.
ii. In medium thick deposits, 5 m is the maximum length of prop, which can be fitted, if need arise.
iii. Steeply dipping thick deposits can be mined along dip.
iv. For very thick deposits ore mining from hanging wall towards footwall becomes essential.

A:-Only i

B:-Only ii

C:-Only iii

D:-All options (i, ii, iii and iv)

Correct Answer:- Option-C

Question71:-Select the option that correctly matches the equipment to the action processes.

Equipment	**Action I Process**
P. Dragline	1. Reaming
Q. Bucket wheel excavator	2. Key cut
R. Tunnel boring machine	3. Pulsating impact
S. Hydraulic hammer	4. Terracing

A:-P–2, Q–4, R–1, S–3

B:-P–1, Q–2, R–3, S–4

C:-P–2, Q–4, R–3, S–1

D:-P–3, Q–4, R–2, S–1

Correct Answer:- Option-A

Question72:-Which pump has single helical rotor, and can be used at coal face for pumping water having coal particles of various sizes ?

A:-Roto pump

B:-Turbine pump

C:-Submersible pump

D:-Centrifugal pump

Correct Answer:- Option-A

Question73:-How corrosion of a rope can be reduced ?

A:-The action of water containing acids, atmospheric moisture, coal dust

B:-Longitudinal oscillation of winding rope

C:-By through lubrication and galvanized wire

D:-Discarding the rope in service when it has lost 10 percent of its strength

Correct Answer:- Option-C

Question74:-Match the following

Component	Function
P. Drill	1. Utilization of energy in fragmentation of rock
Q. Drill rod	2. Reduction of energy loss due to regrinding
R. Drill bit	3. Conversation of original form of energy into mechanical energy
S. Flushing	4. Transmission of energy from prime mover to applicator

A:-P-3, Q-1, R-2, S-4

B:-P-4, Q-1, R-3, S-2

C:-P-3, Q-4, R-1, S-2

D:-P-2, Q-1, R-3, S-4

Correct Answer:- Option-C

Question75:-Side Dump Loader (SDL) and Load Haul Dumper (LHD) are

A:-Scraper loaders

B:-Bucket loaders

C:-Duckbill loaders

D:-Gathering arm loaders

Correct Answer:- Option-B

Question76:-A district of a mine is ventilated by $30m^3$ /sec quantity of air and the water gauge across the district is 25 mm. If the quantity has to be reduced to $20m^3$ /sec by installing a regulator in the return of the district, what will be the resistance of the regulator ?

A:-1/30 kμ

B:-1/16 kμ

C:-20/576 kμ

D:-10/625 kμ

Correct Answer:- Option-C

Question77:-Which of the following statement/statements is correct for ventilation standards ?
i. in every ventilating district, not less than six cubic meters per minute of air per person employed in the district on the largest shift or not less than 2.5 cubic meters per minute of air per tonne of daily output, whichever is larger, passes along the last ventilation connection in the district which means the in-bye most gallery in the district along which the air passes;
ii. at every place in the mine where persons are required to work or pass, the air does not contain less than 18 percent of oxygen or more than 0.5 percent of carbon dioxide or any noxious gas in quantity likely to affect the health of any person;
iii. the percentage of inflammable gas does not exceed 1.25 in the general body of

the return air of any ventilating district and 0.75 in any place in the mine;
iv. the wet bulb temperature in any working place does not exceed 33.5 degrees centigrade, and where the wet bulb temperature exceeds 30.5 degrees centigrade, arrangements are made to ventilate the same with a current of air moving at a speed of not less than one meter per second

A:-Only i

B:-Only i and iv

C:-Only ii and iii

D:-All options i, ii, iii and iv

Correct Answer:- Option-B

Question78:-As per CMR-2017, the maximum exposure limit for respirable coal dust concentration in Indian mines is

A:-$2mg/m^3$ where free silica present is less than 5%

B:-$3mg/m^3$where free silica present is less than 5%

C:-$5mg/m^3$where free silica present is less than 5%

D:-$10mg/m^3$where free silica present is less than 5%

Correct Answer:- Option-A

Question79:-The average temperature in upcast and downcast shaft in a mine are 40 degree C and
30 degree C respectively. The shafts are 300 m deep. What will be the motive column of air (downcast shaft air) causing natural ventilation ?

A:-7.83 m

B:-9.58 m

C:-11.83 m

D:-15 m

Correct Answer:- Option-B

Question80:-Which is incorrect statement for the measurement of the air velocity ?

A:-Smoke cloud method : smoke cloud gathering device consist of glass tube 125 to 15 mm long and 12.5 mm in diameter filled with granular pumice stone of 0.8 - 1.2 mm size soaked with tin or titanium tetrachloride

B:-Tracer gas method : tracer gases like oxides of nitrogen have been used for measuring air quantities

C:-Hot wire anemometers : it consists of wheat-stone bridge

D:-Pitot tube : is a device which can be used to measure the static pressure only

Correct Answer:- Option-D

Question81:-Sirocco fan is a type of

A:-Axial flow fan

B:-Air screw fan

C:-Centrifugal fan

D:-Auxiliary fan

Correct Answer:- Option-C

Question82:-Which of the following mine gases is most toxic to human health ?

A:-Carbon monoxide (CO)

B:-Carbon dioxide (CO_2)

C:-Nitrous fumes (NOx)

D:-Radon (Rn)

Correct Answer:- Option-C

Question83:-Which is the most acceptable theory of coal spontaneous combustion ?

A:-Pyrite theory

B:-Coal-oxygen complex theory

C:-Bacterium theory

D:-Electro-chemical and bacterium theory

Correct Answer:- Option-B

Question84:-In firedamp explosion, the stoichiometric concentration of CH_4 is _____ and maximum explosion pressure develops at about _____ of CH_4 in air.

A:-5.4%, 5.4%

B:-5.4%, 14.8%

C:-5%, 15%

D:-9.5%, 10%

Correct Answer:- Option-D

Question85:-Which of the following reserve estimation methods is based on assigning weighted averages to sample values depending on their location and distance ?

A:-Polygonal method

B:-Geostatistical method

C:-Triangular method

D:-Cross-sectional method

Correct Answer:- Option-B

Question86:-The mineral resource for which the tonnage, grade and mineral content can be estimated with a reasonable level of confidence is called

A:-Inferred mineral resource

B:-Indicated mineral resource

C:-Proved mineral resource

D:-Probable mineral resource

Correct Answer:- Option-B

Question87:-Ore grade for which revenue earned from the recoverable reserve equals the cost of mining, treatment and marketing is known as

A:-Cut-off grade

B:-Average grade

C:-Break-even grade

D:-Liquidation grade

Correct Answer:- Option-C

Question88:-Which one of the following does not belong to the direct operating cost of a mine ?

A:-Administrative cost

B:-Royalty

C:-Fuel cost

D:-Explosive cost

Correct Answer:- Option-A

Question89:-In the Kriging interpolation technique, the weights assigned to each sample are determined based on

A:-Inverse distance from the sample to the estimation point

B:-Variogram model and spatial correlation of data

C:-Arithmetic mean of all available samples

D:-Standard deviation of the dataset

Correct Answer:- Option-B

Question90:-Which of the following best describes Net Present Value (NPV) in mine valuation ?

A:-The difference between present value of cash inflows and outflows

B:-The sum of undiscounted cash flows

C:-The future value of a project's revenue

D:-The rate at which future cash flows break even

Correct Answer:- Option-A

Question91:-Which factors are considered for the mine planning ?

A:-Geologic factors

B:-Economic factors

C:-Technological factors

D:-All the above factors

Correct Answer:- Option-D

Question92:-The stages involved in planning of a new mine follows the order.

A:-Exploration, strategy report preparation, feasibility report preparation, detailed project report preparation

B:-Strategy report preparation, exploration, feasibility report preparation, detailed project report preparation

C:-Strategy report preparation, feasibility report preparation, exploration, detailed project report preparation

D:-Feasibility report preparation, detailed project report preparation, strategy report preparation, exploration

Correct Answer:- Option-A

Question93:-In coal mines, the optimal location of the main shaft to achieve maximum operational advantage is

A:-At the footwall of coal deposit

B:-At the hangwall of coal deposit

C:-At the rise side of coal deposit

D:-At the centre of coal deposit

Correct Answer:- Option-D

Question94:-What does mine life refer to ?

A:-Total gestation period of the mine

B:-Total duration of mineral extraction from the mine

C:-Total lifespan of mining equipment

D:-Total number of employees working in the mine

Correct Answer:- Option-B

Question95:-Which main factor is taken into account for ventilation planning of a new underground coal mine ?

A:-Daily production

B:-Percentage of inflammable gas

C:-Percentage of co_2

D:-Wet-bulb Temperature (WBT)

Correct Answer:- Option-A

Question96:-What is the key factor influencing the size of pillars in underground coal mines ?

A:-Depth of coal seam

B:-Inclination of coal seam

C:-Width of gallery

D:-Coal seam depth and gallery width

Correct Answer:- Option-D

Question97:-Which Section of the Mines and Minerals (Development and Regulation) Act, 1957, stipulates the grant of composite licence through auction for minerals ?

A:-Section 7

B:-Section 8

C:-Section 11

D:-Section 12

Correct Answer:- Option-C

Question98:-Which of the following provisions is true regarding the environmental clearance of mining projects as per the Mineral Concession Rules ?

A:-Environmental clearance is required only for coal mining

B:-Environmental clearance is not necessary for small-scale mining projects

C:-Environmental clearance is mandatory for all mining activities, regardless of scale

D:-The State Government can waive environmental clearance in special cases

Correct Answer:- Option-C

Question99:-As per the Coal Mines Regulations, 2017, the degree of gassiness of coal seams is decided based on the

A:-Percentage of inflammable gas in general body of air

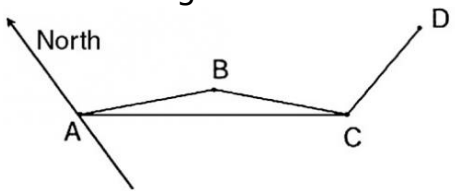
B:-Rate of emission of inflammable gas per tonne of coal production

C:-Both percentage of inflammable gas in general body of air and rate of inflammable gas emission per tonne of coal production

D:-Methane content of the coal seam

Correct Answer:- Option-C

Question100:-In an underground correlation survey by the Weisbach triangle (figure below) the following data are obtained.
AB = 3.50 m, BC = 2.75 m, CA = 6.20 m, ∠ACD = 179°14’33”, ∠BCD = 179°10’17” and bearing of AB = 115°23’49”. The bearing of traverse CD is



A:-102°27’16”

B:-114°41’43.14”

C:-115°27’16”

D:-179°14’16”

Correct Answer:- Option-B