JNUEE MSC Environmental Science

Topic:- SESM223 JNUS21

1) Consider the following nuclear reaction

p + p = d + e+ + ve

(Given mp = 1.007276 amu and md = 2.013553 amu)

What can be the maximum energy of the neutrino?

[Question ID = 15784][Question Description = M.Sc.SESM_Q_001]

1. ~ 0.18 MeV

   [Option ID = 128307]
2. ~ 0.42 MeV

   [Option ID = 128308]
3. ~ 0.51 MeV

   [Option ID = 128309]
4. ~ 0.86 MeV

   [Option ID = 128310]

2) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : A periodic function can be expressed as a superposition of harmonic waves.

Reason R : A periodic wave is a harmonic wave.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15785][Question Description = M.Sc.SESM_Q_002]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128311]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128312]
3. **A** is true but **R** is false

   [Option ID = 128313]
4. **A** is false but **R** is true

   [Option ID = 128314]

3) What is the variance of the molecular speed of 1 mol of He gas in thermal equilibrium at 300 ºK? (Treat He gas as an ideal gas)

[Question ID = 15786][Question Description = M.Sc.SESM_Q_003]

1. ~ 2.83 x 105 (m/s)2

   [Option ID = 128315]
2. ~ 2.74 x 104 (m/s)2

   [Option ID = 128316]
3. ~ 6.73 x 105 (m/s)2

   [Option ID = 128317]
4. ~ 1.82 x 106 (m/s)2.

   [Option ID = 128318]

4) A 200 keV photon is backscattered through Compton Scattering. The energy of the backscattered photon is

[Question ID = 15787][Question Description = M.Sc.SESM_Q_004]

1. ~ 88 keV

   [Option ID = 128319]
2. ~ 102 keV

   [Option ID = 128320]
3. ~ 112 keV

   [Option ID = 128321]
4. ~ 146 keV

   [Option ID = 128322]

5) The ground state wave function for a particle of mass m executing 1-D harmonic oscillations with frequency ω is

$U_0(x) = A \exp(-m\omega x^2/2\hbar)$

What is the value of normalization constant A?

[Question ID = 15788][Question Description = M.Sc.SESM_Q_005]

1. $(m\omega/\pi\hbar)^{1/4}$

   [Option ID = 128323]
2. $(m\omega/\pi\hbar)^{1/2}$

   [Option ID = 128324]
3. $(m\omega\pi/\hbar)^{1/4}$

   [Option ID = 128325]
4. $(m\omega/\hbar)^{1/2}$

   [Option ID = 128326]

6) Consider the free expansion of 1.0 mole of an ideal gas from an initial volume of 1.0 litre to a final volume of 4.0 litre. What is the change in the entropy of the gas?[Question ID = 15789][Question Description = M.Sc.SESM_Q_006]

1. ~ 5.04 J/K

   [Option ID = 128327]
2. ~ 11.5 J/K

   [Option ID = 128328]
3. 0

   [Option ID = 128329]
4. ~ 2.61 J/K

   [Option ID = 128330]

7) Identify the correct sequence in decreasing order of the mass of the following elementary particles?

A. Pion

B. Neutron

C. Higgs Boson

[Question ID = 15790][Question Description = M.Sc.SESM_Q_007]

1. B > C > A

   [Option ID = 128331]
2. C > A > B

   [Option ID = 128332]
3. A > C > B

   [Option ID = 128333]
4. C > B > A

   [Option ID = 128334]

8) Arrange the following substances in decreasing order of their magnitudes of magnetic susceptibilities at normal temperature (300 ^oK).

A. Aluminium

B. Copper

C. Platinum

Choose the *correct* answer from the options given below

[Question ID = 15791][Question Description = M.Sc.SESM_Q_008]

1. C, A, B

   [Option ID = 128335]
2. A, C, B

   [Option ID = 128336]
3. B, A, C

   [Option ID = 128337]
4. C, B, A

   [Option ID = 128338]

9)

Match **List I** with **List II**

List I	**List II**
(Occurrence/Process)	**(Pollutants)**

A. Mie scattering	I. SO_2
B. Acid rain	II. N_2O
C. Ozone depletion	III. Aerosols
D. Incineration	IV. Dioxins

Choose the **correct** answer from the options given below:

[Question ID = 15792][Question Description = M.Sc.SESM_Q_009]

1. A -II , B - I, C - III, D -IV [Option ID = 128339]
2. A - III, B - II, C -I , D -IV [Option ID = 128340]
3. A -IV , B -I , C - II, D - III [Option ID = 128341]
4. A -III , B -I , C -II , D - IV [Option ID = 128342]

10) Match **List I** with **List II**

List I	**List II**
(Particle)	**(Quark composition)**
A. Proton	I. uus
B. Lambda (Λ^0)	II. uud
C. Sigma (Σ^+)	III. udd
D. Delta (Δ^0)	IV. uds

Choose the **correct** answer from the options given below:

[Question ID = 15793][Question Description = M.Sc.SESM_Q_010]

1. A -I , B - III, C -II , D - IV [Option ID = 128343]
2. A - II, B -I , C -IV , D - III [Option ID = 128344]
3. A -II , B -IV , C -I , D -III [Option ID = 128345]
4. A -I , B -IV , C -III, D - II [Option ID = 128346]

11) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : The quality of the received signals in FM transmission is much better than AM transmission.

Reason R : The FM signals do not get impacted by physical barriers.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15794][Question Description = M.Sc.SESM_Q_011]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128347]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128348]
3. **A** is true but **R** is false

   [Option ID = 128349]
4. **A** is false but **R** is true

   [Option ID = 128350]

12) Environmental problems with relatively high-risk to human welfare are

A. Habitat alteration and destruction

B. Acid deposition

C. Oil spills

D. Stratospheric ozone depletion

E.Global climate change

Choose the *correct* answer from the options given below:

[Question ID = 15795][Question Description = M.Sc.SESM_Q_012]

1. A, D and E only [Option ID = 128351]
2. B and E only [Option ID = 128352]
3. C, D and E only [Option ID = 128353]
4. E only [Option ID = 128354]

13) Which of the following bonds is/are responsible for the condensation of inert gas atoms and nonpolar molecules into liquid phase?

A. Ionic bonds

B. Covalent bonds

C. Van der waals bonds

D. Hydrogen bonds

Choose the *correct* answer from the options given below:

[Question ID = 15796][Question Description = M.Sc.SESM_Q_013]

1. A, B and D only [Option ID = 128355]
2. B only [Option ID = 128356]
3. B and C only [Option ID = 128357]
4. C only [Option ID = 128358]

14) Which of the following semiconductor materials have their band-gap energy values in the interval 1.0 eV to 2.0 eV?

A. Ge

B. Si

C. GaAs

D. CdS

E. CdTe

Choose the *correct* answer from the options given below:

.

[Question ID = 15797][Question Description = M.Sc.SESM_Q_014]

1. A, B and E only [Option ID = 128359]
2. B, C and E only [Option ID = 128360]
3. B and C only [Option ID = 128361]
4. B, C, D and E only [Option ID = 128362]

15) Which of the following instruments are based on wave nature of light?

A. Transmission Electron microscope

B. X-Ray diffractometer

C. Reflecting Telescope

D. Michelson interferrometer

Choose the *correct* answer from the options given below:

[Question ID = 15798][Question Description = M.Sc.SESM_Q_015]

1. A, B and D only [Option ID = 128363]
2. B, C and D only [Option ID = 128364]
3. A only [Option ID = 128365]
4. A, B and C only [Option ID = 128366]

16) Which of the follwing logic gates is/are termed as Universal gate(s)?

A. OR

B. NOR

C. NAND

D. AND

E. XOR

Choose the *correct* answer from the options given below:

[Question ID = 15799][Question Description = M.Sc.SESM_Q_016]

1. B, C, D and E only [Option ID = 128367]
2. B and C only [Option ID = 128368]
3. C, D and E only [Option ID = 128369]
4. B only [Option ID = 128370]

17) Emitter Follower has the following characteristics

A. High power gain

B. Output voltage in phase with input voltage

C. High input resistance

D. Voltage gain ≥ 1

E. Low output resistance

Choose the *correct* answer from the options given below:

[Question ID = 15800][Question Description = M.Sc.SESM_Q_017]

1. A, B and D only [Option ID = 128371]
2. C and D only [Option ID = 128372]
3. B, C and D only [Option ID = 128373]
4. B, C and E only [Option ID = 128374]

18) An operational amplifier has open loop gain of 80 dB at 100 Hz. What is its gain bandwidth product?

[Question ID = 15801][Question Description = M.Sc.SESM_Q_018]

1. 10^3 Hz

   [Option ID = 128375]
2. 10^4 Hz

   [Option ID = 128376]
3. 10^5 Hz

   [Option ID = 128377]
4. 10^6 Hz

   [Option ID = 128378]

19) A laser source produces light of wavelength λ = 0.6 μm with spectral width Δλ = 0.02 μm. What is the coherence length of the laser light?[Question ID = 15802][Question Description = M.Sc.SESM_Q_019]

1. 18.0 μm

   [Option ID = 128379]
2. 7.2 μm

   [Option ID = 128380]
3. 30.0 μm

   [Option ID = 128381]
4. 15.0 μm

   [Option ID = 128382]

20) A 220 V and 50 Hz ac source is connected across a series LCR circuit. The voltage drop across all the three components of the circuit is equal. If R = 1.0 kΩ, the value of C is

[Question ID = 15803][Question Description = M.Sc.SESM_Q_020]

1. 2.17 μF

   [Option ID = 128383]
2. 5.14 μF

   [Option ID = 128384]
3. 3.18 μF

   [Option ID = 128385]
4. 7.32 μF.

   [Option ID = 128386]

21) The density of table salt is 2.16 g/mL at 20°C. What is its specific gravity?

[Question ID = 15804][Question Description = M.Sc.SESM_Q_021]

1. 1.08 [Option ID = 128387]
2. 2.16 [Option ID = 128388]
3. 1 [Option ID = 128389]
4. 4.32 [Option ID = 128390]

22) What is the ratio of the numbers of oxygen atoms that are combined with a given number of nitrogen atoms in the compounds N_2O_3 and NO?

[Question ID = 15805][Question Description = M.Sc.SESM_Q_022]

1. 3/1 [Option ID = 128391]
2. 2/1 [Option ID = 128392]
3. 3/2 [Option ID = 128393]
4. 2/3 [Option ID = 128394]

23) Three samples of magnesium oxide were analyzed to determine the mass ratios O/Mg, giving the following results:

$$\frac{1.60\text{ g O}}{2.43\text{ g Mg}};\ \frac{0.658\text{ g O}}{1.00\text{ g Mg}};\ \frac{2.29\text{ g O}}{3.48\text{ g Mg}}$$

Which of the following laws is illustarted by the above data?

[Question ID = 15806][Question Description = M.Sc.SESM_Q_023]

1. Law of Constant Composition [Option ID = 128395]
2. Law of Multiple Proportions [Option ID = 128396]
3. Law of Conservation of Matter [Option ID = 128397]
4. Law of Conservation of Matter and Energy [Option ID = 128398]

24) Arrange the following in order of increasing charge to mass ratio

$^{12}C^{+}$, $^{12}C^{2+}$, $^{14}N^{+}$, $^{14}N^{2+}$

Choose the correct option from those given below:

[Question ID = 15807][Question Description = M.Sc.SESM_Q_024]

1. $^{12}C^{+} < ^{12}C^{2+} < ^{14}N^{+} < ^{14}N^{2+}$

   [Option ID = 128399]
2. $^{12}C^{2+} < ^{12}C^{+} < ^{14}N^{2+} < ^{14}N^{+}$

   [Option ID = 128400]
3. $^{14}N^{+} < ^{12}C^{+} < ^{14}N^{2+} < ^{12}C^{2+}$

   [Option ID = 128401]
4. $^{1\,4}N^{+} < ^{14}N^{2+} < ^{12}C^{+} < ^{12}C^{2+}$

   [Option ID = 128402]

25) Identify the correct statements on mass spectrometers from those given below:

A. Mass spectrometers measure the charge-to-mass ratio of charged particles.

B. Mass spectrometers create negative ions by bombarding a gas sample with low energy electrons causing the gas molecules to absorb electrons.

C. Mass spectrometers can be used to measure the masses of isotopes.

D. Mass spectrometers can be used to determine isotopic abundance

Choose the *correct* answer from the options given below:

[Question ID = 15808][Question Description = M.Sc.SESM_Q_025]

1. A, B and D only [Option ID = 128403]
2. A, C and D only [Option ID = 128404]
3. A, B and C only [Option ID = 128405]
4. B, C and D only [Option ID = 128406]

26) Arrange the following elements from most negative to least negative electron affinity.

A. K

B. Br

C. Cs

D. Cl

Choose the *correct* answer from the options given below

[Question ID = 15809][Question Description = M.Sc.SESM_Q_026]

1. D, B, A, C [Option ID = 128407]
2. B, D, A, C [Option ID = 128408]
3. A, C, D, B [Option ID = 128409]
4. C, A, D, B [Option ID = 128410]

27) From the following compounds, choose those that are likely to be soluble in water

A. NaBr

B. $Cu(OH)_2$

C. $PbCl_2$

D. AgI

E. Fe_2O_3

F. $Mg(NO_3)_2$

G. $(NH_4)_2SO_4$

Choose the *correct* answer from the options given below:

[Question ID = 15810][Question Description = M.Sc.SESM_Q_027]

1. A, B, C, D, and E only [Option ID = 128411]
2. A, F, and G only [Option ID = 128412]
3. B, C, D, and E only [Option ID = 128413]
4. A, D, and E only [Option ID = 128414]

28) Match **List I** with **List II**

List I	List II
A. $NaClO_4$	I. Strong electrolyte
B. $HClO_2$	II. Weak electrolyte
C. CH_3CH_2OH	III. Nonelectrolyte

Choose the **correct** answer from the options given below:

[Question ID = 15811][Question Description = M.Sc.SESM_Q_028]

1. A - I, B - II, C - III [Option ID = 128415]
2. A - II, B - III, C - I [Option ID = 128416]
3. A - III, B - I, C - II [Option ID = 128417]
4. A - II, B - I, C - III [Option ID = 128418]

29) Given below are two statements

Statement I: The cathode is defined as the electrode at which *reduction* occurs as electrons are gained by some species. The anode is the electrode at which *oxidation* occurs as electrons are lost by some species.

Statement II: Each of these can be either the positive or the negative electrode depending on the cell type.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15812][Question Description = M.Sc.SESM_Q_029]

1. Both Statement I and Statement II are true [Option ID = 128419]
2. Both Statement I and Statement II are false [Option ID = 128420]
3. Statement I is true but Statement II is false [Option ID = 128421]
4. Statement I is false but Statement II is true [Option ID = 128422]

30) What is the correct formula for sodium nitride?[Question ID = 15813][Question Description = M.Sc.SESM_Q_030]

1. NaN [Option ID = 128423]
2. NaN_3 [Option ID = 128424]
3. Na_3N [Option ID = 128425]
4. $NaNO_3$ [Option ID = 128426]

31) What mass of sodium is contained within the NaCl in a packet of salt containing 0.50 g NaCl?[Question ID = 15814] [Question Description = M.Sc.SESM_Q_031]

1. 1.25 g [Option ID = 128427]
2. 0.50 g [Option ID = 128428]
3. 0.20 g [Option ID = 128429]
4. 0.10 g [Option ID = 128430]

32) Identify the correct statements from those given below

A. An orbital that penetrates into the region occupied by core electrons is more shielded from nuclear charge than an orbital that does not penetrate and therefore has a higher energy.

B. An orbital that penetrates into the region occupied by core electrons is less shielded from nuclear charge than an orbital that does not penetrate and therefore has a higher energy.

C. An orbital that penetrates into the region occupied by core electrons is less shielded from nuclear charge than an orbital that does not penetrate and therefore has a lower energy.

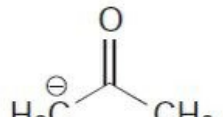
D. An orbital that penetrates into the region occupied by core electrons is more shielded from nuclear charge than an orbital that does not penetrate and therefore has a lower energy.

Choose the correct answer from the options given below:

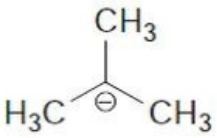
[Question ID = 15815][Question Description = M.Sc.SESM_Q_032]

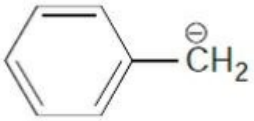
1. A only [Option ID = 128431]
2. B only [Option ID = 128432]
3. C only [Option ID = 128433]
4. A, B and D only [Option ID = 128434]

33) Arrange the following carbanions in order of increasing stability

A. 

B. 

C. 

D. 

Choose the ***correct*** answer from the options given below

[Question ID = 15816][Question Description = M.Sc.SESM_Q_033]

1. A, B, C, D

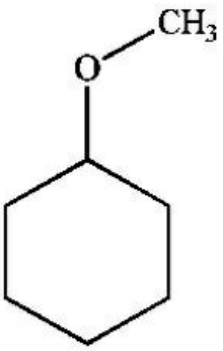
   [Option ID = 128435]
2. C, B, D, A

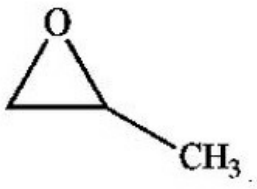
   [Option ID = 128436]
3. B, C, D, A

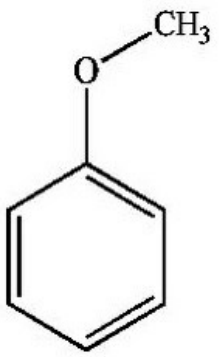
   [Option ID = 128437]
4. D, A, B, C

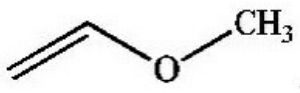
   [Option ID = 128438]

34) Which of the following are ethers?

A. 

B. 

C. 

D. 

Choose the ***correct*** answer from the options given below:

[Question ID = 15817][Question Description = M.Sc.SESM_Q_034]

1. A, and B only

   [Option ID = 128439]
2. A, and D only

   [Option ID = 128440]
3. A, B, and C only

   [Option ID = 128441]
4. A, B, C, and D

   [Option ID = 128442]

35) The nucleophillic addition of water to an aldehyde or ketone

[Question ID = 15818][Question Description = M.Sc.SESM_Q_035]

1. is irreversible.

   [Option ID = 128443]
2. is dependent on the carbonyl structure.

   [Option ID = 128444]
3. is favoured by neutral conditions.

   [Option ID = 128445]
4. produces a stable tetrahedral product.

   [Option ID = 128446]

36) Arrange the following oxyacids of chlorine in the order of increasing acid strength

A. Hypochlorous acid

B. Chlorous acid

C. Chloric acid

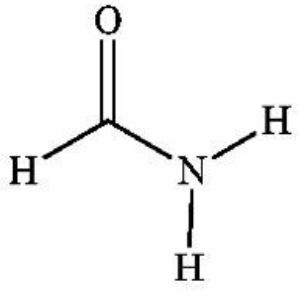
D. Perchloric acid

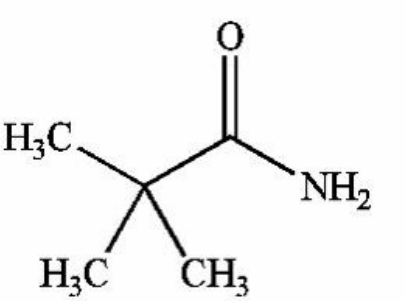
Choose the *correct* answer from the options given below

[Question ID = 15819][Question Description = M.Sc.SESM_Q_036]

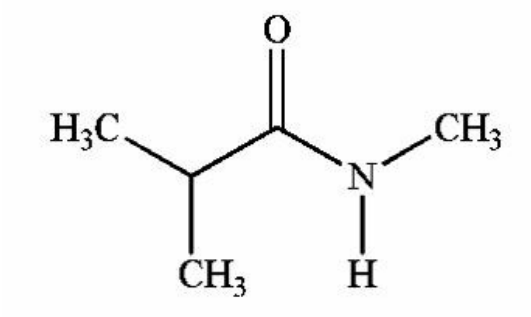
1. A, B, C, D [Option ID = 128447]
2. B, C, D, A [Option ID = 128448]
3. C, D, A, B [Option ID = 128449]
4. D, C, B, A [Option ID = 128450]

37) Which of the following compounds is a 2^0 amide?[Question ID = 15820][Question Description = M.Sc.SESM_Q_037]

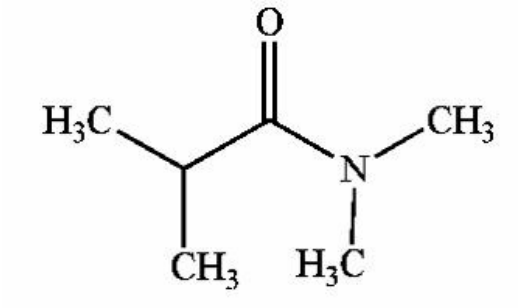
1. 

   [Option ID = 128451]
2. 

[Option ID = 128452]

3. 

[Option ID = 128453]

4. 

[Option ID = 128454]

38) The x-axis (horizontal axis) of a mass spectrum represents [Question ID = 15821][Question Description = M.Sc.SESM_Q_038]

1. mass only [Option ID = 128455]
2. mass/energy [Option ID = 128456]
3. mass/charge [Option ID = 128457]
4. charge only [Option ID = 128458]

39) Match **List I** with **List II**

List I	List II
A. $H_2NCH_2NHCH_2NH_2$	I. tridentate
B. $C_2O_4^{2-}$	II. bidentate
C. water	III. monodentate
D. $EDTA^{4-}$	IV. hexadentate

Choose the **correct** answer from the options given below:

[Question ID = 15822][Question Description = M.Sc.SESM_Q_039]

1. A - I , B - II , C - III , D - IV [Option ID = 128459]
2. A - II , B - III , C - IV , D - I [Option ID = 128460]
3. A - III , B - IV , C - I , D - II [Option ID = 128461]
4. A - IV , B - III , C - II, D - I [Option ID = 128462]

40) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : CO is called the "silent killer."

Reason R : Our senses cannot detect the presence of this gas.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15823][Question Description = M.Sc.SESM_Q_040]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128463]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128464]
3. **A** is true but **R** is false

   [Option ID = 128465]
4. **A** is false but **R** is true

   [Option ID = 128466]

41) Match **List I** with **List II**

List I	List II

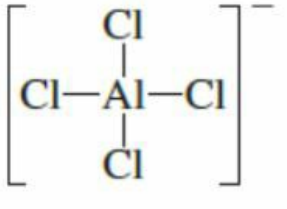
A. AsH_3	I. Electron-rich hydride
B. B_2H_6	II. Electron-deficient hydride
C. KH	III. Ionic hydride
D. CH_4	IV. Electron-precise hydride

Choose the **correct** answer from the options given below:

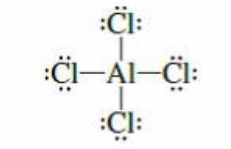
[Question ID = 15824][Question Description = M.Sc.SESM_Q_041]

1. A - I , B - II , C - III, D - IV [Option ID = 128467]
2. A - II, B - III, C - IV, D - I [Option ID = 128468]
3. A - III , B - IV , C - I, D - II [Option ID = 128469]
4. A - IV, B - III , C - II, D - I [Option ID = 128470]

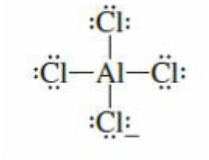
42) Identify the correct Lewis structure for $AlCl_4^-$ [Question ID = 15825][Question Description = M.Sc.SESM_Q_042]

1. 

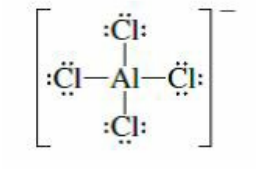
[Option ID = 128471]

2. 

[Option ID = 128472]

3. 

[Option ID = 128473]

4. 

[Option ID = 128474]

43) The layer between the core and the crust is called

[Question ID = 15826][Question Description = M.Sc.SESM_Q_043]

1. Mantle

[Option ID = 128475]

2. Asthenosphere

[Option ID = 128476]

3. Lithosphere

[Option ID = 128477]

4. Crusty core

[Option ID = 128478]

44) The pyroclastic particles that cool and solidify from lava as it is propelled through the air are called

[Question ID = 15827][Question Description = M.Sc.SESM_Q_044]

1. Lahars

[Option ID = 128479]

2. Pahoehoe

[Option ID = 128480]

3. Tephra

[Option ID = 128481]

4. Caldera

[Option ID = 128482]

45) The most common carbonate minerals are

[Question ID = 15828][Question Description = M.Sc.SESM_Q_045]

1. Olivine and plagioclase

   [Option ID = 128483]
2. Amphibole and quartz

   [Option ID = 128484]
3. Calcite and gypsum

   [Option ID = 128485]
4. Calcite and dolomite

   [Option ID = 128486]

46) Which of the following mineral exhibits adamantine luster?[Question ID = 15829][Question Description = M.Sc.SESM_Q_046]

1. Diamond [Option ID = 128487]
2. Calcite [Option ID = 128488]
3. Quartz [Option ID = 128489]
4. Nepheline [Option ID = 128490]

47) Under hot and humid climatic conditions, feldspar alters to

[Question ID = 18406][Question Description = M.Sc.SESM_Q_047]

1. Garnet

   [Option ID = 128491]
2. Kaoline

   [Option ID = 128492]
3. Hornblend

   [Option ID = 128493]
4. Serpentine

   [Option ID = 128494]

48) An event or situation in the natural or human made environment that adversely affects human life, property and health is

[Question ID = 18407][Question Description = M.Sc.SESM_Q_048]

1. Disaster

   [Option ID = 128495]
2. Hazard

   [Option ID = 128496]
3. Natural phenomena

   [Option ID = 128497]
4. Vulnerability

   [Option ID = 128498]

49) Which rocks result from the alteration of other rocks by heat, pressure and the chemical activity of fluids?

A. Igneous rocks

B. Metamorphic rocks

C. Sedimentary rocks

[Question ID = 18408][Question Description = M.Sc.SESM_Q_049]

1. A and C [Option ID = 128499]
2. A only [Option ID = 128500]
3. B and C [Option ID = 128501]
4. B only [Option ID = 128502]

50) Which of the following is/are NOT a mineral?

A. Salt

B. Ice

C. Quartz

D. Asphalt

Choose the *correct* answer from the options given below:

[Question ID = 18409][Question Description = M.Sc.SESM_Q_050]

1. D only [Option ID = 128503]

2. B and D [Option ID = 128504]
3. B only [Option ID = 128505]
4. C and D [Option ID = 128506]

51) "Gossan is a good indicator of which of the following deposits?"

A. Uranium

B. Phosphorite

C. Sulphide

D. Chromite

Choose the *correct* answer from the options given below:

[Question ID = 18410][Question Description = M.Sc.SESM_Q_051]

1. A and B [Option ID = 128507]
2. C only [Option ID = 128508]
3. C and D [Option ID = 128509]
4. B only [Option ID = 128510]

52) The most characteristic features of a placer deposit are_____

A. High specific gravity, durability and chemically resistance

B. Low specific gravity, friable and chemically resistance

C. High specific gravity, friable and chemically resistance

D. High specific gravity, durable and chemically reactive

Choose the *correct* answer from the options given below:

[Question ID = 18411][Question Description = M.Sc.SESM_Q_052]

1. A only [Option ID = 128511]
2. A and D [Option ID = 128512]
3. C and D [Option ID = 128513]
4. B only [Option ID = 128514]

53) Which of the following statements about a mineral is/are NOT true?

A. It is organic

B. It has definite physical and chemical properties

C. It is naturally occurring

D. It is a crystalline solid

Choose the *correct* answer from the options given below:

[Question ID = 18412][Question Description = M.Sc.SESM_Q_053]

1. A and C only [Option ID = 128515]
2. A only [Option ID = 128516]
3. B, C and D only [Option ID = 128517]
4. B only [Option ID = 128518]

54) Match **List I** with **List II**

List I	List II
ERA	**Age (Ma)**
A. Hadean	I. 2500-541
B. Archean	II. 4600-4000
C. Proterozoic	III. 541-252
D. Paleozoic	IV. 4000-2500

Choose the **correct** answer from the options given below:

[Question ID = 18413][Question Description = M.Sc.SESM_Q_054]

1. A - II, B - IV, C - I, D -III [Option ID = 128519]
2. A -I, B - II, C - III, D - IV [Option ID = 128520]
3. A - IV, B - III, C - II, D - I [Option ID = 128521]
4. A - II, B - I, C - IV, D - III [Option ID = 128522]

55) Match **List I** with **List II**

List I	List II
Drainage pattern	**Geological controls**
A. Dendritic	I. Bed rock cut by perpenditular joints and fractures
B. Radial	II. Area with long parallel folds of sedimentary rocks
C. Rectangular	III. Undeformed sedimentary rocks of uniform composition
D. Trellis	IV. Volcanic cones of homogeneous composition

Choose the **correct** answer from the options given below:

[Question ID = 18414][Question Description = M.Sc.SESM_Q_055]

1. A - IV, B - I, C - II, D - III [Option ID = 128523]
2. A - II, B - III, C - IV, D - I [Option ID = 128524]
3. A - III, B - II, C - I, D - IV [Option ID = 128525]
4. A - III, B - IV, C - I, D - II [Option ID = 128526]

56) Given below are two statements

Statement I: Primary waves (P-waves) are compressional waves that travel quickly through rock.

Statement II: P-waves travel as a series of contractions and expansions, pushing and pulling particles in the direction of their path of travel.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 18415][Question Description = M.Sc.SESM_Q_056]

1. Both Statement I and Statement II are correct

   [Option ID = 128527]
2. Both Statement I and Statement II are incorrect

   [Option ID = 128528]
3. Statement I is correct but Statement II is incorrect

   [Option ID = 128529]
4. Statement I is incorrect but Statement II is correct

   [Option ID = 128530]

57) Given below are two statements

Statement I: During divergence, ocean basins continue to expand as molten rock erupts that form mid-oceanic ridges.

Statement II: The process of plate growth at mid-oceanic ridge is known as mountain building activity.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 18416][Question Description = M.Sc.SESM_Q_057]

1. Both Statement I and Statement II are true

   [Option ID = 128531]
2. Both Statement I and Statement II are false

   [Option ID = 128532]
3. Statement I is true but Statement II is false

   [Option ID = 128533]
4. Statement I is false but Statement II is true

   [Option ID = 128534]

58) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : Chemical weathering process is more effective in tropical environments.

Reason R : Temperature and rainfall are high in tropical environments.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 18417][Question Description = M.Sc.SESM_Q_058]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128535]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128536]
3. **A** is true but **R** is false

   [Option ID = 128537]
4. **A** is false but **R** is true

   [Option ID = 128538]

59) Osmolarity of human blood is about [Question ID = 18418][Question Description = M.Sc.SESM_Q_059]

1. 1000 mosm L^{-1} [Option ID = 128539]
2. 300 mosm L^{-1} [Option ID = 128540]
3. 50 mosm L^{-1} [Option ID = 128541]
4. 25 mosm L^{-1} [Option ID = 128542]

60) Match **List I** with **List II**

List I	List II
A.Human Growth Hormone	I. Pancreas
B.Cortisol	II. Pituitary gland
C. Somatostatin	III. Corpus luteum
D. Progesterone	IV. Adrenal gland

Choose the **correct** answer from the options given below:

[Question ID = 18419][Question Description = M.Sc.SESM_Q_060]

1. A-II, B-IV, C-I, D-III [Option ID = 128543]
2. A-IV, B-II, C-I, D-III [Option ID = 128544]
3. A-III, B-I, C-II, D-IV [Option ID = 128545]
4. A-I, B-III, C-IV, D-II [Option ID = 128546]

61) Which of the following is NOT the strategy adopted by an r-selected species?

[Question ID = 18420][Question Description = M.Sc.SESM_Q_061]

1. Few, large offspring

   [Option ID = 128547]
2. Rapid Growth

   [Option ID = 128548]
3. Short life

   [Option ID = 128549]
4. Little investment in individual offspring

   [Option ID = 128550]

62) Given below are two statements

Statement I: The anatomy of the leaf is highly specialized for light absorption.

Statement II: Below the epidermis, the top layers of photosynthetic cells are called palisade cells.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 18421][Question Description = M.Sc.SESM_Q_062]

1. Both Statement I and Statement II are true

   [Option ID = 128551]
2. Both Statement I and Statement II are false

   [Option ID = 128552]
3. Statement I is true but Statement II is false

   [Option ID = 128553]
4. Statement I is false but Statement II is true

   [Option ID = 128554]

63) The most dangerous pests in agriculture are

[Question ID = 18422][Question Description = M.Sc.SESM_Q_063]

1. Mammals [Option ID = 128555]
2. Birds [Option ID = 128556]
3. Insects [Option ID = 128557]
4. Nematodes [Option ID = 128558]

64) Which of the following are general biological features of weeds?

1. **Development of weak roots**
2. **Ability of seeds or fruits to spread far and wide**
3. **Must not bear flowers**
4. **Ability to maintain long-term viability in the soil**

Choose the *correct* answer from the options given below:

[Question ID = 18423][Question Description = M.Sc.SESM_Q_064]

1. A and B only [Option ID = 128559]
2. C and D only [Option ID = 128560]
3. B and D only [Option ID = 128561]

4. A and C only [Option ID = 128562]

65) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: The cell wall of Diatoms protects the cell against predation and is resistant to decay.

Reason R: The Diatom frustules are composed of silica.

In light of the above statements, choose the *most appropriate* answer from the options given below

[Question ID = 18424][Question Description = M.Sc.SESM_Q_065]

1. Both **A** and **R** are correct and **R** is the correct explanation of **A**

   [Option ID = 128563]
2. Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**

   [Option ID = 128564]
3. **A** is correct but **R** is not correct

   [Option ID = 128565]
4. **A** is not correct but **R** is correct

   [Option ID = 128566]

66) That the length of the day is the determining factor in flowering in plants, was established by[Question ID = 18425] [Question Description = M.Sc.SESM_Q_066]

1. Julius von Sachs [Option ID = 128567]
2. Garner and Allard [Option ID = 128568]
3. Devlin and Kay [Option ID = 128569]
4. H.H. Cousins [Option ID = 128570]

67) Which of the following are among the 17 Sustainable Development Goals established in the year 2015?

1. **Life on Land**
2. **Affordable and Clean Energy**
3. **Life below Water**
4. **Decent Work and Economic Growth**

Choose the *correct* answer from the options given below:

[Question ID = 15830][Question Description = M.Sc.SESM_Q_067]

1. A and C only [Option ID = 128571]
2. B and D only [Option ID = 128572]
3. B and C only [Option ID = 128573]
4. A, B, C and D [Option ID = 128574]

68) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : On the basis of variation in mean temperature across latitudes, the main climatic regions of the Earth are categorized.

Reason R : A mountain located in a tropical region will have tropical, subtropical, temperate and alpine zones.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15831][Question Description = M.Sc.SESM_Q_068]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128575]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128576]
3. **A** is true but **R** is false

   [Option ID = 128577]
4. **A** is false but **R** is true

   [Option ID = 128578]

69) Arrange the following in the increasing order of their susceptibility to leaching from the soil

1. **NO^{3-}**
2. **SO_4^{2-}**
3. **Mg^{2+}**
4. **K^{+}**
5. **PO_4^{3-}**

Choose the *correct* answer from the options given below

[Question ID = 15832][Question Description = M.Sc.SESM_Q_069]

1. B,D,E,C,A [Option ID = 128579]

2. C,D,E,A,B [Option ID = 128580]
3. E,D,C,A,B [Option ID = 128581]
4. E,D,C,B,A [Option ID = 128582]

70) In viruses, the nucleic acid is surrounded by[Question ID = 15833][Question Description = M.Sc.SESM_Q_070]

1. capsid [Option ID = 128583]
2. cell wall [Option ID = 128584]
3. lysosome [Option ID = 128585]
4. liposome [Option ID = 128586]

71) Which one of the following is a monosaccharide?[Question ID = 15834][Question Description = M.Sc.SESM_Q_071]

1. Fructose [Option ID = 128587]
2. Glycogen [Option ID = 128588]
3. Lactose [Option ID = 128589]
4. Sucrose [Option ID = 128590]

72) Which of the following statements is true for the micelles when they are formed by dissolving fatty acids in water ?

[Question ID = 15835][Question Description = M.Sc.SESM_Q_072]

1. Hydrocarbon chains remain on the surface and carboxylic acid groups are sequestered inside the micelles.

   [Option ID = 128591]
2. Polar head groups remain on the surface and hydrocarbon tails are sequestered inside the micelles.

   [Option ID = 128592]
3. Hydrocarbon tails remain on the surface and polar head groups are sequestered inside the micelles.

   [Option ID = 128593]
4. Hydrophobic tails remain on the surface and hydrophilic heads are sequestered inside the micelles.

   [Option ID = 128594]

73) In the backbone of DNA, phosphodiester bond links[Question ID = 15836][Question Description = M.Sc.SESM_Q_073]

1. a nitrogenous base and a phosphate group [Option ID = 128595]
2. a sugar and a nitrogenous base [Option ID = 128596]
3. a sugar to another sugar [Option ID = 128597]
4. a nitrogenous base and another nitrogenous base [Option ID = 128598]

74) Match **List I** with **List II**

List I	**List II**
(Microbes)	**(Diseases)**
A. *Staphylococcus aureus*	I. Plague
B. *Yersinia pestis*	II. Oral thrush
C. *Candida albicans*	III. Peptic ulcer
D. *Helicobacter pylori*	IV. Toxic shock syndrome

Choose the **correct** answer from the options given below:

[Question ID = 15837][Question Description = M.Sc.SESM_Q_074]

1. A - I , B - II , C - III, D - IV [Option ID = 128599]
2. A - II, B - III, C - IV, D - I [Option ID = 128600]
3. A - III, B - IV, C - I, D - II [Option ID = 128601]
4. A - IV, B - I, C - II, D - III [Option ID = 128602]

75) Which among the following cause inhibition of cell wall synthesis in bacteria ?

A. vancomycin, methicillin

B. penicillin, ampicillin

C. polymiixin B, rifampin

D. gentamicin, streptomycin

E. tetracycline, erythromycin

Choose the *correct* answer from the options given below:

[Question ID = 15838][Question Description = M.Sc.SESM_Q_075]

1. A and B only [Option ID = 128603]
2. C and D only [Option ID = 128604]
3. C and E only [Option ID = 128605]
4. D and E only [Option ID = 128606]

76) At physiological pH, which among the following amino acids have net positive charge ?

A. Lysine

B. Arginine

C. Asparagine

D. Glutamine

E. Alanine

Choose the *correct* answer from the options given below:

[Question ID = 15839][Question Description = M.Sc.SESM_Q_076]

1. C, D and E only [Option ID = 128607]
2. A and B only [Option ID = 128608]
3. C and D only [Option ID = 128609]
4. D and E only [Option ID = 128610]

77) Phosphoglycerides are molecules that contain

A. glycerol

B. two fatty acids chains

C. phosphorylated alcohol

D. cholesterol

E. glucose

Choose the *correct* answer from the options given below:

[Question ID = 15840][Question Description = M.Sc.SESM_Q_077]

1. A, B and C only [Option ID = 128611]
2. C, D and E only [Option ID = 128612]
3. B, C and D only [Option ID = 128613]
4. B, C and E only [Option ID = 128614]

78) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A :

The peptide unit which links amino acids in protein is rigid and planar.

Reason R :

The carbon-nitrogen bond of the peptide unit has partial double bond character.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15841][Question Description = M.Sc.SESM_Q_078]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128615]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128616]
3. **A** is true but **R** is false

   [Option ID = 128617]
4. **A** is false but **R** is true

   [Option ID = 128618]

79) Arrange the following radiation in decreasing order of wavelength:

A. Infrared
B. Ultraviolet radiation
C. X-rays
D. Microwaves

Choose the ***correct*** answer from the options given below

[Question ID = 15842][Question Description = M.Sc.SESM_Q_079]

1. D > A > C > B [Option ID = 128619]
2. D > A > B > C [Option ID = 128620]
3. A > D > C > B [Option ID = 128621]
4. A > D > B > C [Option ID = 128622]

80) Given below are two statements

Statement I:

In analytical epidemiology, the common study designs used are cohort studies and case-control studies.

Statement II:

Case-control studies start with a population that has been exposed to the risk factor and cohort studies start with the

population who have the disease.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 15843][Question Description = M.Sc.SESM_Q_080]

1. Both Statement I and Statement II are true [Option ID = 128623]
2. Both Statement I and Statement II are false [Option ID = 128624]
3. Statement I is true but Statement II is false [Option ID = 128625]
4. Statement I is false but Statement II is true [Option ID = 128626]

81)

If $f(x) = \int_1^x \frac{\log p}{1+p}\, dp$, for p >0 and x >0. The value of f (e) + f (1/e) is

[Question ID = 15844][Question Description = M.Sc.SESM_Q_081]

1. 0 [Option ID = 128627]
2. 2/3 [Option ID = 128628]
3. 1/3 [Option ID = 128629]
4. 1/2 [Option ID = 128630]

82)

Given that $(2\hat{\imath} + 6\hat{\jmath} + 27\,\hat{k}) \times (\hat{\imath} + \alpha\hat{\jmath} + \beta\,\hat{k}) = \vec{0}$, where $\hat{\imath}$, $\hat{\jmath}$, and $\hat{k}$ are unit vectors along X-axis, Y-axis and Z-axis, respectively. If you represent the straight line αx + βy -2 = 0 in the form y = mx + c, then which among the following represent the correct values of m and c?

A. -4/9

B. 4/27

C. -2/9

D. 2/27

E. 4/9

Choose the ***correct*** answer from the options given below:

[Question ID = 15845][Question Description = M.Sc.SESM_Q_082]

1. A and B, respectively

   [Option ID = 128631]
2. C and E , respectively

   [Option ID = 128632]
3. E and D, respectively

   [Option ID = 128633]
4. C and B, respectively

   [Option ID = 128634]

83) Match **List I** with **List II**

List I	**List II**
Functions	**Antiderivarive Functions**
A. cos x + sin x	I. tan x - cot x +C
B. sin x - cos x	II. sec x - csc x +C
C. $\sec^2 x + \csc^2 x$	III. sin x - cos x + C
D. sec x tan x - csc x cot x	IV. sec x + csc x + C
	V. - sin x - cos x + C

Choose the **correct** answer from the options given below:

[Question ID = 15846][Question Description = M.Sc.SESM_Q_083]

1. A -III , B -V , C - I, D - II [Option ID = 128635]
2. A -V , B -III , C -I , D -IV [Option ID = 128636]
3. A -III , B -V , C - I, D - IV [Option ID = 128637]
4. A -V , B -III , C -IV , D - II [Option ID = 128638]

84) An air parcel in the atmosphere is said to be staturated if

A. its temperature gets equal to the dew point temperature.

B. the rate of evaporation is higher than the rate of condensation in the air parcel.

C. its water vapor mixing ratio get equal to the saturation water vapor mixing ratio.

D. the rate of evaporation become equal to the rate of condensation in the air parcel.

E. its water vapor mixing ratio become lower than the saturation water vapor mixing ratio.

Choose the *correct* answer from the options given below:

[Question ID = 15847][Question Description = M.Sc.SESM_Q_084]

1. A, B and E only

   [Option ID = 128639]
2. A, C and D only

   [Option ID = 128640]
3. B and E only

   [Option ID = 128641]
4. B and D only

   [Option ID = 128642]

85) If y1(x) and y2(x) are two linearly independent solutions of the linear differential equation $a_0(x)$ y" + a1(x) y' + a2(x) y = 0 then

A. y1(x) y2(x) is also a solution

B. y1(x) / y2(x) is also a solution

C. y1(x) + y2(x) is also a solution

D. $y1^2(x)$ + $y2^2(x)$ is also a solution

Choose the *correct* answer from the options given below:

[Question ID = 15848][Question Description = M.Sc.SESM_Q_085]

1. A, B and C only

   [Option ID = 128643]
2. A and B only

   [Option ID = 128644]
3. C only

   [Option ID = 128645]
4. C and D only

   [Option ID = 128646]

86) The Lapalace transform of f(t) = t is[Question ID = 17657][Question Description = M.Sc.SESM_Q_086]

1. 1/s [Option ID = 128647]
2. $1/s^2$ [Option ID = 128648]
3. (s-1)/s [Option ID = 128649]
4. $1-(1/s^2)$ [Option ID = 128650]

87) If the vectors $\vec{a} = 2\hat{\imath} - \hat{\jmath} + \hat{k}, \vec{b} = \hat{\imath} + 2\hat{\jmath} - 3\hat{k}$ and $\vec{c} = 3\hat{\imath} + \lambda\hat{\jmath} + 5\hat{k}$, are coplanar, then the value of λ is

[Question ID = 17658][Question Description = M.Sc.SESM_Q_087]

1. -1/2

   [Option ID = 128651]
2. 0

   [Option ID = 128652]
3. 2

   [Option ID = 128653]
4. -4

   [Option ID = 128654]

88) If A and B are any two sets, then $(A \cup B) - (A \cap B) =$

[Question ID = 17659][Question Description = M.Sc.SESM_Q_088]

1. A - B

   [Option ID = 128655]
2. B - A

   [Option ID = 128656]
3. $(A - B) \cup (B - A)$

   [Option ID = 128657]
4. $(A - B) \cap (B - A)$

   [Option ID = 128658]

89) Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**

Assertion A: The rank of $A = \begin{bmatrix} 0 & -1 & 5 \\ 2 & 4 & -6 \\ 1 & 1 & 5 \end{bmatrix}$ is 3.

Reason R: If we transform the matrix A in row-echelon form, the number of nonzero rows is 2.

In light of the above statements, choose the ***most appropriate*** answer from the options given below

[Question ID = 17660][Question Description = M.Sc.SESM_Q_089]

1. Both **A** and **R** are correct and **R** is the correct explanation of **A**

   [Option ID = 128659]
2. Both **A** and **R** are correct but **R** is NOT the correct explanation of **A**

   [Option ID = 128660]
3. **A** is correct but **R** is not correct

   [Option ID = 128661]
4. **A** is not correct but **R** is correct

   [Option ID = 128662]

90) The tropopause is the upper limit of the troposphere. Arrange the approximate tropopause height at the following lattitudnal circles in the increasing order.

A. Equator

B. Tropics

C. Mid-latitudes

D. Polar circles

E. Poles

Choose the *correct* answer from the options given below

[Question ID = 17661][Question Description = M.Sc.SESM_Q_090]

1. A, B, C, D, E [Option ID = 128663]
2. E, D, C, B, A [Option ID = 128664]
3. E, C, D, B, A [Option ID = 128665]
4. B, A, D, C, E [Option ID = 128666]

91) If the roots of the equation $ax^3 + bx^2 + cx + d = 0$ are in arithmetic progression, then which of the following conditions is true? [Question ID = 17662][Question Description = M.Sc.SESM_Q_091]

1. $2b^3 - 9abc + 27a^2d = 0$ [Option ID = 128667]
2. $b^3 - 18abc + 27a^2d = 0$ [Option ID = 128668]
3. $b^3 + 18abc - 27a^2d = 0$ [Option ID = 128669]
4. $2b^3 + 9abc - 27a^2d = 0$ [Option ID = 128670]

92)

$$If\ f(x) = x\ sin\frac{1}{x}\ for\ x \neq 0\ and\ f(0) = 0,$$
$$then\ which\ of\ the\ following\ statements\ is\ true?$$

[Question ID = 17663][Question Description = M.Sc.SESM_Q_092]

1. $f(x)$ *is both continuous and derivable at* $x = 0$

   [Option ID = 128671]
2. $f(x)$ *is continuous but not derivable at* $x = 0$

   [Option ID = 128672]
3. $f(x)$ *is neither continuous nor derivable at* $x = 0$

   [Option ID = 128673]

4. $Though \lim_{x\to 0} f(x)\ exists, f(x) is\ not\ continuous\ at\ x = 0$

[Option ID = 128674]

93) The geometric infinite series $1 + x + x^2 + x^3 + \ldots\ldots\ldots\ldots\ converges\ if$

[Question ID = 17664][Question Description = M.Sc.SESM_Q_093]

1. $x \geq 1$

[Option ID = 128675]

2. $x = -1$

[Option ID = 128676]

3. $-1 < x < 1$

[Option ID = 128677]

4. $x < -1$

[Option ID = 128678]

94) The equation of the tangent to the ellipse $4x^2 + 3y^2 = 24\ at\ the\ point\ (\sqrt{3}, 2)\ is$

[Question ID = 17665][Question Description = M.Sc.SESM_Q_094]

1. $2\sqrt{3}x + 3y = 12$

[Option ID = 128679]

2. $\sqrt{3}x - 2y = -1$

[Option ID = 128680]

3. $3x + 2\sqrt{3}y = 12$

[Option ID = 128681]

4. $2x - \sqrt{3}y = 1$

[Option ID = 128682]

95) A circle passes through three points (5,-8), (-2, 9) and (2,1). The coordinates of its centre are[Question ID = 17666] [Question Description = M.Sc.SESM_Q_095]

1. (58, 24) [Option ID = 128683]
2. (24, 58) [Option ID = 128684]
3. (-58, -24) [Option ID = 128685]
4. (-24, -58) [Option ID = 128686]

96) Read the following statements:

A. A square matrix **X** is said to be singular if $|X| = 0$

B. Inverse of a square matrix if it exists, is unique

C. Matrix multiplication is commutative

Identify the correct statements from those given above

[Question ID = 17667][Question Description = M.Sc.SESM_Q_096]

1. A and B only

[Option ID = 128687]

2. B and C only

[Option ID = 128688]

3. A and C only

[Option ID = 128689]

4. A, B and C

[Option ID = 128690]

97) Consider the following mathematical expressions

A. $\lim_{x\to 0} \frac{\tan x - x}{x^2 \tan x} = \frac{1}{3}$

B. $\lim_{x\to 0} \frac{e^x - 2\cos x + e^{-x}}{x \sin x} = 2$

C. $\lim_{x\to 0} \frac{x - \tan x}{x^3} = \frac{1}{3}$

Identify the correct mathematical expressions from those given above

[Question ID = 17668][Question Description = M.Sc.SESM_Q_097]

1. A and B only [Option ID = 128691]
2. B and C only [Option ID = 128692]
3. A and C only [Option ID = 128693]
4. A, B and C [Option ID = 128694]

98) Consider the following statements:

A. The Poisson distribution is a theoretical probability distribution for continuous random variables

B. When n (the number of trials) is large and p (the probability of success) is small, the binomial probabilities are approximated by means of the Poisson distribution

C. The mean and variance of a Poisson distribution are identical

Identify the correct statements from those given above

[Question ID = 17669][Question Description = M.Sc.SESM_Q_098]

1. A and B only [Option ID = 128695]
2. B and C only [Option ID = 128696]
3. A and C only [Option ID = 128697]
4. A, B and C [Option ID = 128698]

99) Consider the following matrices:

A. $\begin{pmatrix} 1 & 7 \\ 3 & 4 \\ 4 & 9 \end{pmatrix}$

B. $\begin{pmatrix} 1 & 2 & 3 \\ 4.5 & 9 & 13.5 \\ 3 & 6 & 9 \end{pmatrix}$

C. $\begin{pmatrix} 0 & 1 & 2 & 1 \\ 1 & 2 & 3 & 2 \\ 3 & 1 & 1 & 3 \end{pmatrix}$

Arrange the above matrices in increasing order of their rank

[Question ID = 17670][Question Description = M.Sc.SESM_Q_099]

1. A, B, C [Option ID = 128699]
2. A, C, B [Option ID = 128700]
3. B, C, A [Option ID = 128701]
4. B, A, C [Option ID = 128702]

100) Given below are two statements, one is labelled as Assertion A and the other is labelled as Reason R

Assertion A : Karl Pearson Coefficient of correlation is widely used by the scientific community to explore associations/relationships between variables.

Reason R : Its formula helps in capturing both linear and curvilinear associations/relationships very efficiently.

In light of the above statements, choose the *correct* answer from the options given below

[Question ID = 17671][Question Description = M.Sc.SESM_Q_100]

1. Both **A** and **R** are true and **R** is the correct explanation of **A**

   [Option ID = 128703]
2. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

   [Option ID = 128704]
3. **A** is true but **R** is false

   [Option ID = 128705]
4. **A** is false but **R** is true

   [Option ID = 128706]