MODEL QUESTIONS FOR ECET-2013

GENERAL SUBJECTS
MATHEMATICS

1. The maximum value of $5+8\text{Cos}\theta +6\text{Sin }\theta$ is   [   ]

   1) 25   2) 19   3) 15   4) 5

2. The value of $\text{Cos}10^0\text{Cos}50^0\text{Cos}70^0$ is   [   ]

   1) $\frac{\sqrt{3}}{4}$ 2) $\frac{\sqrt{3}}{2}$ 3) $\frac{\sqrt{3}}{6}$ 4) $\frac{\sqrt{3}}{8}$

3. If $\text{Sec}2\theta = \frac{-2}{\sqrt{3}}$ then the general solution θ is [   ]

   1) $2n\pi \pm \frac{5\pi}{6}$ 2) $n\pi \pm \frac{5\pi}{6}$ 3) $n\pi \pm \frac{5\pi}{12}$ 4) $2n\pi \pm \frac{\pi}{6}$

4. The eccentricity of the ellipse $3x^2 +2y^2 =6$ is   [   ]

   1) $\frac{1}{3}$ 2) $\frac{1}{\sqrt{3}}$ 3) $\frac{1}{4}$ 4) $\frac{1}{2}$

5. $\int_0^1 \frac{xe^x}{(1+x)^2} dx =$ [   ]

   1) $\frac{e-2}{2}$ 2) e-2   3) $\frac{e-1}{2}$ 4) e-1

PHYSICS

1. If young's modulus 'Y', surface tension 'S' and velocity 'V' are chosen as fundamental quantities, the dimensional formula for force is   [   ]
   a. $Y^{-5}V^{-4}S^6$
   b. $Y^{-3}V^5S^5$
   c. $Y^{-5}V^{-4}S^5$
   d. $Y^{-3}V^{-4}S^6$

2. A ballon moves up with constant velocity 10m/s. An object is dropped from it when it is at a height of 100 m above the ground. The distance between the object and the ballon after 5 sec is (g=10m/s^2)   [   ]
   a. 120 m
   b. 125 m
   c. 100 m

d. 150 m

3. The time period of an oscillating simple pendulum is 'T'. If its length is increased by 5 cm then the time period is 'T_1' and the time period is 'T_2' if the length is reduced by 5 cm. The relationship among T, T_1, T_2

    [   ]
    a. $T^2 = T_1{}^2 + T_2{}^2$
    b. $T^2/2 = T_1{}^2 + T_2{}^2$
    c. $2T^2 = T_1{}^2 + T_2{}^2$
    d. $3T^2 = T_1{}^2 + T_2{}^2$

4. A gas is heated through 4 K in a closed vessel. If its pressure is increased by 0.8%, the initial temperature of the gas is   [
    ]
    a. 227 K
    b. 454 K
    c. 454 ^{o}C
    d. 227 ^{o}C

5. If light travels through two media with velocities 2.5×10^8 m/s and 2×10^8 m/s respectively, the critical angle for the combination of the two media is

    [   ]
    a. $Sin^{-1}(4/5)$
    b. $Sin^{-1}(3/5)$
    c. $Sin^{-1}(2/5)$
    d. $Sin^{-1}(1/5)$

CHEMISTRY

1. The normality of oxalic acid solution is found to be 0.05N. How many grams of oxalic acid is present in 100 ml of solution.
    a) 1.26   b) 12.6   c) 126   d) 0.126

2. Which of the following is responsible for temporary hardness of water

    a) $Ca\,CO_3$ b) $Ca\,Cl_2$ c) $Ca\,SO_4$ d) $Ca\,(HCO_3)_2$

3. The monomer of Rubber is----
    a) Isoprene   b) Propene   c) Polyisoprene   d) Bakelite

4. Which one of the following is responsible for Global Warming
    a)Particulate   b) Carbon dioxide   c) Hydrogen sulphide   d) Nitrous Oxide

ENGINEERING SUBJECTS
CHEMICAL ENGINNEERING

1. Cast iron is a _____ material.
    a) Malleable   b) Ductile   c) Tough   d) Brittle.

2. The average molecular weight of air is
    a) 20   b) 24   c) 29   d) 80

3. In which of the following process, temperature is constant
   a) Isobaric   b) Iso thermal   c)Adiabatic   d) Adiabatic compression
4. The absorptivity of a perfect black body is
   a) 0   b) 1   c) 0.5   d) 0.8
5. Ball mill is used for
            Attrition   b) Coarse grinding   c) Fine grinding   d) Crushing

CIVIL ENGINEERING

1. What is the Bending moment equation for a simply supported beam with uniformly distributed load, 'ω' with a span of 'l'
   a) $\frac{wl}{2}$ b) $\frac{wl^2}{8}$ c) $\frac{wl^2}{2}$ d) $\frac{WL^2}{4}$

2. What is a long column with load w and effective length l with span to effective depth ratio
   a) $> \frac{l}{12}$ b) $= \frac{l}{12}$ c) $< \frac{l}{12}$ d) $\geq \frac{l}{10}$

3. The Reduced bearing with W.C.B = 120^0
   a) N 30^0 E   b) S 60^0 E   c) N 30^0 W   d) S 30^0 W

4. What is the relation between c_d, c_v, $c_{c \text{ with}}$ orifices
   a) $c_d = \frac{cc}{cv}$ b) $c_{c=}c_v \times c_d$ c) $c_{d=}c_c \times c_v$ d) $c_v = c_c \times c_d$

COMPUTER SCIENCE AND ENGINEERING

1. In a circular linked list, the insertion of a record involves modification of
   a. 3 pointers
   b. 4 pointers
   c. 2 pointers
   d. No pointers
2. Which of the following layer of OSI reference model deals with end to end communication
   a. Presentation layer
   b. Session layer
   c. Network layer
   d. Transport layer
3. Which of the following statements are true regarding java applet
   Statement I : An applet can be trusted always
   Statement II: An applet must be executed using browser
   Statement III: An applet is not able to access the files of the computer in which it runs.
   a. Statement I & II
   b. Statement I & III
   c. Statement II & III
   d. All of the above

ELECTRONICS AND COMMUNICATION ENGINEERING

1. The largest unsigned decimal number that can be represented in binary using 6 bits is
    a. 63
    b. 64
    c. 127
    d. 128

2. A 0-10mA Ammeter with 30Ω internal resistance is to be extended to measure up to 20mA . What value of Shunt resistance is to be connected?
    a. 10 Ω
    b. 20 Ω
    c. 30 Ω
    d. 60Ω

3. The maximum value of modulation index in amplitude modulation is
    a. 10
    b. 5
    c. Infinite
    d. 1

ELECTRICAL AND ELECTRONICS ENGINEERING

1. The period during which the power to the traction motor is cut-off is known as
    a) Cut-off period   c) Coasting
    b) Free running   d) Braking
2. The slow but continuous rotation of the energy meter even under no load is known as
    a) Rotation error   c) creeping error
    b) Jumping error   d) free run error
3. Which of the following is known as Universal gate?
    a) AND   C) OR
    b) NAND   d) NOT

ELECTRONICS AND INSTRUMENTATION ENGINEERING

1. Which of the following is the Bi-Directional flow meter?
    b) Orifice   b) Venturi meter   c) Electromagnetic Flow meter   d) Pitot tube
2. Neutral Zone is equal to
    b) Δ e   b) Δ e/2   c) 2Δ e   d) Δ^2 e
3. Mass spectroscopy deals with
    b) Mass of ions   b) m/e ratio of ions   c) charge of ions d) nuclear charge

MECHANICAL ENGINEERING

1. Speed Control Valves are
    a. Flow Control Valves
    b. Pressure regulating Valves

c. Non – Return Valves

d. Direction Control Valves

2. A simply supported beam has a uniformly distributed load on it . The bending movement diagram is in the form of
   a. Rectangle
   b. Triangle
   c. Parabola
   d. Semicircle

3. The first law of Thermodynamics deals with conservation of
   a. Velocity
   b. Mass
   c. Momentum
   d. Energy

METALLURGICAL ENGINEERING

1. Rawmaterial for production of Aluminium is -------
   a) Bauxite   b) Cryolite   c) Alumina   d) Gibbsite

2. No of slip systems in FCC structure
   a) A. 12   b) 48   c) 16   d) 03

3. ASTM grain size is measured by ------formula
   a) A $N=2^{n-1}$ b)$n=2^{N-1}$ c) $N=2^n-1$ d)$n=2^N-1$
4. In proximate analysis of coal_____ is determined.
   a) Hydrogen, Nitrogen, Oxygen & Carbon
   b) Moisture, ash, Volatile matter & carbon
   c) Hydrogen, ash, Oxygen & Carbon
   d) Sulphure, Moisture & Carbon.
5. In Iso-thermal process
   a) dp=0   b) dt=0   c) dq=0   d) dv=0
6. In LD Process Oxygen is released through the lance at a pressure of _____ .
   a) 150-175 psi   b) 100-150 psi   c) 200-250 psi   d) <100 psi

MINING ENGINEERING

1. In the following gases which one is Poisonous?
   a) CH_4 b) CO_2 c) O_2 d) CO
2. For steeply inclined road ways which type of rope haulage is used.
   a) Direct rope haulage
   b) Endless rope haulage
   c) Gravity rope haulage
   d) Main and Tail rope haulage
3) Fissure vein deposits are
   a) Magmatic concentration deposits

b) Cavity filling deposits
c) Sublimation deposits
d) Residual concentration deposits

CERAMIC TECHNOLOGY

1. Zinc oxide in Glass Improves the Property of   [ ]

  a) Stabilizing   b) Fluxing   c) Opacifying   d) Reafractoriness

2. Fluorepar is added in Enamels as   [ ]

  a) Opacifier   b) Coloring Agent   c) Flux   d) Floating Agent

BIO – TECHNOLOGY

1. Living, unstained cells and organisms can be observedbest using
   a. Fluorescent microscopy
   b. TEM
   c. SEM
   d. Phase contrast microscopy
2. A replicated chromosome consists of two very long strands of identical chromosomal material called
   a. Teomeres
   b. Chromatids
   c. Centromers
   d. Genes
3. Which of the following is a micronutrient?
   a. Carbon
   b. Manganes
   c. Potassium
   d. magnesium

PHARMACY

1. Ball mill works on the principle of   [ ]
   a. Impact
   b. Attrition
   c. Crushing
   d. Both 'a' and 'b'
2. B.C.G. Vaccine contains   [ ]
   a. Living culture
   b. Non-living culture
   c. Natural culture
   d. None
3. Acacia is not used as   [ ]
   a. Diluent

b. Suspending agent
c. Emulsifying agent
d. Binder

B.Sc (Mathematics)

MATHEMATICS

1. Solution of $xdy-ydx =xy^2dx$ is

   a. $\frac{x^2}{2}+\frac{x}{y}=c$

   b. $\frac{x^2}{2}+\frac{y^2}{2}=c$

   c. $x+y=c$

   d. $x^2-y^2=c$

2. The complimentary function of $(D^2-5D+6)y = xe^{4x}$

   a. $y_c=c_1e^{-2x}+c_2e^{-3x}$

   b. $y_c=c_1e^{2x}+c_2e^{3x}$

   c. $y_c=c_1\cos2x+c_2\sin2x$

   d. $y_c=c_1\cosh2x+c_2\sinh2x$

3. The radius of the sphere $x^2+y^2+z^2+6x-8y-t=0$ is 6 then the value of the t is

   a. 8

   b. 10

   c. 11

   d. 9

4. The No.of generators of a cyclic group of order 5

   a. 1

   b. 4

   c. 2

   d. 3

5. The left hand limit of $\lim_{x\to0}\frac{3x+|x|}{7x-5|x|}$ is

   a. 4/5

   b. 3/2

   c. 2/7

   d. 1/6

6. If $f(x) = x$ on $[0,1]$ and $P = \{0,1/3,2/3,1\}$ then $U[P,f]$ is

   a. 2/3

   b. 1/3

   c. 4/3

   d. 5/3

7. If $\bar{r} = xi+yj+zk$ then div $\bar{r}$ is

   a. 2

   b. 3

c. 0

d. 4

8. If S is the surface of the sphere $x^2+y^2+z^2= 1$ then $\int_s (axi + byj + czk) \cdot NdS$ is

   a. $\frac{4\pi}{3}$(a+b+c)

   b. $\frac{2\pi}{3}$(a+b+c)

   c. $\frac{\pi}{3}$(a+b+c)

   d. $\frac{1}{3}$(a+b+c)

9. Let $T:V_2 \to V_3$ be defined by T(x,y) = (x+y,2x-y,7y) then the matrix of T with respect to the standard bases of V_2 and V_3 is

   a. $\begin{bmatrix} 1 & 1 \\ 2 & -1 \\ 0 & 7 \end{bmatrix}$

   b. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \\ 0 & 0 \end{bmatrix}$

   c. $\begin{bmatrix} 1 & 3 \\ 2 & 2 \\ 3 & 1 \end{bmatrix}$

   d. $\begin{bmatrix} 1 & 2 \\ 2 & 3 \\ 4 & 6 \end{bmatrix}$

10. If $\alpha = (2,1,3)$, $\beta = (1,2,3)$ are two vectors in an inner product space $R^3(R)$ then the inner product between α and β is

    a. 13

    b. 12

    c. 11

    d. 10

ANALYTICAL ABILITY

I. Data Sufficiency

In questions 1-2 the choices are same as given below

   (1) If the data I alone is sufficient to answer the question, then (1) is the correct answer.
   (2) If the data II alone is sufficient to answer the question, then (2) is the correct answer.
   (3) If the data I & II both are sufficient to answer the question, then (3) is the correct answer.
   (4) If the data I & II both are not sufficient to answer the question, then (4) is the correct answer.

1. How far is town A from Town C?

I: Town A is 160 kms from town B.   II: Town B is 155 kms from town C

2. If M and N are points on segment RS. What is the length of the segment MN?
   I: The length of segment RM is 10   II: The length of segment NS is 8

II.

a) Sequence and Series:
3. RTV, OQS, LNP, IKM, _____
   (1) FHJ   (2) GIK
   (3) GHJ   (4) GIJ
4. Find the missing term in the series 1,9,17,33,49,73, _____
   (1) 97   (2) 98
   (3) 99   (4) 100
b) Data Analysis:-

Note:- Answer questions 5 and 6 after reading the table

Food Items	Jan	Feb	March	April	May	June
Rice	250	230	210	260	240	220
Wheat	320	340	280	290	300	360
Sugar	240	210	200	210	160	150
Pulses	360	300	320	245	235	250
Vegetables	380	390	385	375	355	370
Misc.	460	485	440	460	475	480

5. The quantity of sugar used in month of April is approximately what percent of the total of food items used in April.
   (1) 21%   (2) 18%
   (3) 11%   (4) 25%
6. What is the respective ratio of the total quality of food items used in the month of March to the quantity of food items used in the month of April?
   (1) 366: 367   (2) 361: 365
   (3) 248:245   (4) 367:368
c) **Coding and Decoding Problems:**
7. If BELIEF is written as AFKKDI, then the code for SELDOM is
   (1) TFKENP   (2) RFKFNP
   (3) RFKENN   (4) RDKCNL
8. In a row of six persons D and C are immediate neighbors of E. B is a neighbor of A only. A is the forth from F who are on the two end points?
   (1) F,B   (2) F,C
   (3) B,D   (4) C,A

COMMUNICATIVE ENGLISH

Sample
I want to buy **.........** **lap top**   a) a   b) an   c) the   d) none of the above
Will you please sit _____ me?   a) beside   b) by   c) besides   d) between
I _____ since morning.   a) Am working   b) was working   c) worked   d) have been working
It _____ to hold a meeting in the office today.   a) Is proposed   b) proposed   c) they proposed   d) is proposing
Each of the boys _____ for the game show.   a) Were called   b) was called   c) were calling   d) are call
Farmers work on land to produce food for us, _____   a) Isn't it?   B) doesn't it?   C) weren't they? D) don't they?
Examine   a) Check   b) cheque   c) exact   d) disclose
Analyse   a) Synthesise b) co ordinate   c) organise   d) concise
One who is recovering from illness   a) Sickness   b) convalescent   c) conduit   d) ill-free
...relevant   a) Un   b) dis   c) mis   d) ir
_____ is today's newspaper.   a) Hear   b) her   c) heir   d) here
I invited everyone ____ Rahim to the party.   a) Accept   b) except   c) exempt   d) extinct
The father / along with his son were found /missing from the party/ held at the   A   B   C   D   Function hall.
Being a Sunday, I stayed at home.   a) I am being the Sunday   b) It being a Sunday   c) When being the Sunday   d) On being a Sunday
The workers are *hell bent at getting* what is due to them.   a) hell bent on getting   b)hell bent for getting   c)hell bent upon getting   d) No improvement
A passage of suitable level of difficulty may be given to test comprehension skills.

tomorrow? / to come with us/ to have dinner /Would you like
    A   B   C   D
   a) acdb   b) cd ba   c) dcba   d) dbca

A: May I leave the room now Madam?   B: Yes you may.   a) Requesting   b) Seeking permission   c) Apologising   d) Commanding