This Question Booklet contains 24 printed pages

DE-2024

Total Marks : 200
Time : 150 Minutes

Question Booklet Code : **A**

A
Seal Sticker

Candidate's Seat No. :

Candidate's Signature _____ **Block Supervisor's Signature** _____

DO NOT OPEN QUESTION BOOKLET UNTIL INSTRUCTED.

INSTRUCTIONS FOR CANDIDATE:

1. Check Number printed on your OMR SHEET and Question Paper with your SEAT No. before answering the questions. Consult block supervisors in case the above mentioned numbers do not match with your seat number.
2. There are two sections in this question paper. There are total 100 questions. For answer of each question A, B, C, D, E options are given in OMR SHEET. In OMR SHEET, there is "E" option. "E" option is for "Not Attempted". If candidate do not wish to answer the question he/she should select "E" option (Not Attempted). All questions are compulsory.

   For Example:

   Which state of India has the longest sea shore ?

   A ○ B ○ C ● D ○ E ○

   (A) Maharashtra (B) Tamilnadu

   (C) Gujarat (D) Andhra Pradesh

   In this example, the right answer is (C). Therefore, the Circle of (C) has been darkened (encoded). Candidate should not give the answer "Gujarat" in writing.

   The options once darkened/answered by candidate cannot be changed.
3. Candidates are not permitted to leave examination hall during examination.
4. Candidates must strictly enter SEAT NO. in the designated space provided in OMR SHEET as well as Question Paper neatly as soon as they receive the OMR SHEET & Question Paper.
5. Candidates must not write name or put any identification sign/symbol on OMR SHEET. In such case strict disciplinary action will be taken against candidate & will be considered disqualified/ineligible. Only Seat No. must be entered at designated space provided in OMR SHEET.
6. Both, Candidate's & Supervisor's signature must be done on Certificate of OMR SHEET. Unsigned OMR SHEET would not be considered for evaluation.
7. Candidates are not permitted to use or carry with them any kind of literature, guide, hand written notes, or printed books, mobile phone, pagers, smart watches, camera or any electronic gadgets to examination hall.
8. Use of only Non-scientific / Non-programmable calculator shall allow during examination.
9. Candidates are not permitted to talk/discuss in the Examination Hall. Any candidate found violating supervisor's instructions will be disqualified.
10. Candidates must fully darken circle A, B, C, D and E accordingly with Blue / Black ball pen. If answers are marked with any other coloured ball pen, pencil, white ink (whitner), any corrections are done by candidate by means of blade or rubber or whitner will not be considered for evaluation.
11. Candidates may carry QP with them after Examination.
12. **For correct answer 2 (Two) marks will be given.**

    For negative marking :

    If candidate -

    • Gives wrong answer or

    • Darkens more than one option (multi mark) as answer for one question

    in OMR SHEET then 0.50 marks will be deducted.

    If candidate does not want to answer a particular question and marks (E) or leave the option without encoding on OMR sheet, then no minus marks will be given.

Submit the OMR SHEET to the block supervisor after completion of examination without fail before leaving examination hall, failure to do so will result in disqualification of the candidature for the examination and disciplinary action will be taken against such candidate.

SECTION - 1

001. પાવરનો એસ.આઈ. એકમ શું થાય ?

(A) જૂલ (B) વૉલ્ટ

(C) વોટ (D) એમ્પિયર

002. એક માઈક્રોમીટર સ્ક્રુ નો પેચ 0.5 mm છે. તેની વર્તુળાકાર માપપટ્ટી પર 50 કાપા હોય તો તેની લઘુત્તમ માપશક્તિ શું થાય છે ?

(A) 0.1 mm (B) 0.001 mm

(C) 1 mm (D) 0.01 mm

003. 10 ડાઈન = ... ન્યુટન

(A) 10^{-5} (B) 10^{-4}

(C) 10^{5} (D) 10^{7}

004. ઉર્જાનો CGS એકમ શું છે ?

(A) ન્યુટન (B) વોટ

(C) જૂલ (D) અર્ગ

005. પાણીના વક્રિભવનાંકનું માપન કરતાં, મળેલા મુલ્યો આ મુજબના છે. 1.30, 1.32, 1.34, 1.35, 1.31 તો સરેરાશ નિરપેક્ષ ત્રૂટી શોધો.

(A) 0.01254 (B) 0.1254

(C) 1.254 (D) 0.001254

006. કયા સાધનની મદદથી રીંગનો અંદરનો વ્યાસનું માપન કરી શકાય ?

(A) વર્નિયર કેલીપર્સ (B) માઈક્રોમીટર સ્ક્રુ

(C) સ્ફેરોમીટર (D) ભૌતિક તુલા

007. ન્યુટનના બીજા નિયમનું ગાણિતીક સ્વરૂપે ..... છે.

(A) F = mv (B) P = mv

(C) F = ma (D) P = ma

008. જો કોઈ વસ્તુનું દળ 5 kg હોય, તેમજ તેની ઉપર લગાડવામાં આવતું બળ 30N હોય, તો ઉત્પન્ન થતો પ્રવેગ શોધો.

(A) 0.6 m/s^2 (B) 6 m/s^2

(C) 6 m/s (D) 0.6 m/s

009. ..... એ બળનો આઘાતના ઉદાહરણો છે.

(A) પેકીંગ કરતી વખતે ચાઈના કે કાચના સાધનોને પેપરમાં વિટાંળવામાં આવે છે.

(B) ટ્રેનની બોગીઓ (ડબ્બા) વચ્ચે બફર રાખવામાં આવે છે.

(C) (A) અને (B) બન્ને

(D) ઉપરોક્ત પૈકી એક પણ નહીં

SECTION - 1

001. What is the S.I unit of power?

(A) Joule (B) Volt

(C) Watt (D) Ampere

002. The pitch of micrometer screw is 0.5 mm. There are 50 divisions on it's circular scale. What will be the least count of the screw?

(A) 0.1 mm (B) 0.001 mm

(C) 1 mm (D) 0.01 mm

003. 10 dyne = _____ N?

(A) 10^{-5} (B) 10^{-4}

(C) 10^{5} (D) 10^{7}

004. What is the unit of Energy in CGS.

(A) Newton (B) Watt

(C) Joule (D) Arg

005. The refractive index of water is found to have the values 1.30, 1.32, 1.34, 1.35, 1.31. Calculate the mean absolute error.

(A) 0.01254 (B) 0.1254

(C) 1.254 (D) 0.001254

006. Which instrument is used to measure "Inner diameter of the ring"?

(A) Vernier caliper (B) Micrometer screw

(C) Spherometer (D) Physical balance

007. The mathematical expression for Newton's second law is _____

(A) F = mv (B) P = mv

(C) F = ma (D) P = ma

008. Find the acceleration produced by applying a force of 30 N on an object of mass of 5 kg.

(A) 0.6 m/s^2 (B) 6 m/s^2

(C) 6 m/s (D) 0.6 m/s

009. _____ are the examples of impulse of force.

(A) China wares are wrapped in paper while packing.

(B) Bogies of a train are provided with the buffers.

(C) Both (A) and (B)

(D) None of above

010. એક પદાર્થ ઉપરની તરફ વર્તુળાકાર ગતિ કરતો હોય તો નીચેનામાંથી કયું બળની અસર અનુભવતો નહીં હોય ?

(A) ગુરૂત્વાકર્ષણ બળ
(B) કેન્દ્રગામી બળ
(C) ઘર્ષણ બળ
(D) કેન્દ્રત્યાગી બળ

011. ..... એ ક્ષેત્રીય બળ છે.

(A) ગુરૂત્વાકર્ષણ બળ
(B) ચુંબકીય બળ
(C) વિદ્યુતીય બળ
(D) ઉપરોક્ત તમામ

012. બાહ્ય બળ લગાળતા થતા કાર્ય સાથે પ્રણાલીમાં ..... માં સરખો જ ફેરફાર થાય છે.

(A) કુલ ઉર્જા
(B) ગતિ ઉર્જા
(C) સ્થિતી ઉર્જા
(D) ઉપરોક્ત પૈકી એક પણ નહીં

013. એક અવરોધ સાથે 6v ની બેટરી જોડેલ છે. સર્કીટમાંથી પસાર થતો પ્રવાહ 0.4 mA હોય, તો અવરોધનું મુલ્ય શું થશે ?

(A) 10 kΩ
(B) 15 kΩ
(C) 20 kΩ
(D) 24 kΩ

014. પરમિટિવિટિ (પારગમ્યતા)નો એકમ ..... છે.

(A) Nm^2/C^2
(B) A/m
(C) N/m^2C
(D) C^2/ Nm^2

015. ઈલેક્ટ્રીક ફ્લક્સ (વિદ્યુત ફ્લક્સ) ..... પર આધારીત છે.

(A) વિદ્યુત ક્ષેત્રની તિવ્રતા
(B) વિસ્તાર
(C) સપાટી અને વિદ્યુત ક્ષેત્ર વચ્ચેનો કોણ
(D) ઉપરોક્ત તમામ

016. અવરોધના વ્યસ્તને ..... કહે છે.

(A) પ્રવાહ (વિદ્યુત પ્રવાહ)
(B) વિશિષ્ટ અવરોધ
(C) કન્ડક્ટન્સ
(D) વૉલ્ટેજ

017. 10 Ω અને 20 Ω ના બે અવરોધોને સમાંતર જોડાણથી જોડેલા હોય, તો તેમનો સમતુલ્ય અવરોધનું મુલ્ય શું થશે ?

(A) 10 Ω
(B) 20 Ω
(C) 30 Ω
(D) 6.6 Ω

018. કેપેસીટન્સનો એકમ ..... થાય.

(A) Q/C
(B) C/V
(C) Q/V
(D) C

019. નીચેની ધાતુઓ એલ્યુમીનીયમ, કોપર, લોખંડ, ચાંદીને થર્મલ વાહકતાના વધતા ક્રમમાં ગોઠવો.

(A) લોખંડ, એલ્યુમિનીયમ, તાંબુ, ચાંદી
(B) એલ્યુમીનીયમ, લોખંડ, તાંબુ, ચાંદી
(C) તાંબુ, લોખંડ, ચાંદી, એલ્યુમીનીયમ
(D) લોખંડ, તાંબુ, એલ્યુમીનીયમ, ચાંદી

010. A body is moving in a vertical circular motion, which one of the following forces does not experience?

(A) Force of gravity
(B) Centripetal force
(C) Friction force
(D) Centrifugal force

011. _____ is the field force.

(A) Gravitational force
(B) Magnetic force
(C) Electrical force
(D) All of above

012. The work done by the external forces on a system equals the changes in _____

(A) Total energy
(B) Kinetic energy
(C) Potential energy
(D) None of these

013. 6V battery is connected across a resistance R. The current through R is 0.4 mA. What will be the value of R ?

(A) 10 kΩ
(B) 15 kΩ
(C) 20 kΩ
(D) 24 kΩ

014. _____ is the Unit of permitivity.

(A) Nm^2/C^2
(B) A/m
(C) N/m^2C
(D) C^2/ Nm^2

015. The Electric flux depends on the _____

(A) Electric field intensity
(B) Area
(C) Angle between the surface and the electric field
(D) All of these

016. Inverse of Resistance is known as _____

(A) current
(B) specific resistance
(C) conductance
(D) voltage

017. What is the effective value of resistance when two resistors 10 Ω and 20 Ω are connected in parallel combination ?

(A) 10 Ω
(B) 20 Ω
(C) 30 Ω
(D) 6.6 Ω

018. The Unit of capacitance is _____

(A) Q/C
(B) C/V
(C) Q/V
(D) C

019. Arrange the metals Aluminium, Copper, Iron and Silver in increasing order of thermal conductivity.

(A) Iron, Aluminium, Copper, Silver
(B) Aluminium, Iron, Copper, Silver
(C) Copper, Iron, Silver, Aluminium
(D) Iron, Copper, Aluminium, Silver

020. કયા તાપમાને સેલ્સીયસ અને ફેરનીહીટ સરખા થાય છે ?

(A) 40°C (B) 40°F

(C) – 40°C અને – 40°F (D) ઉપરોક્ત પૈકી એક પણ નહીં

021. ઉષ્માધારિતાનો એકમ ..... છે.

(A) J/K (B) Cal/K

(C) Cal/°C (D) ઉપરોક્ત તમામ

022. તાપમાન વધારતા, થર્મલ કન્ડક્ટીવીટી (થર્મલ વાહકતા) ..... છે.

(A) ઘટે (B) વધે

(C) અચળ રહે (D) શૂન્ય થાય

023. વિશિષ્ટ ઉષ્માનું ગાણિતીક સ્વરૂપ ..... છે.

(A) $C = Q / m\Delta T$ (B) $Q = C / m\Delta T$

(C) $Hc = Q / \Delta L$ (D) $Q = Hc / \Delta L$

024. એક વ્યક્તિને 104°F જેટલો તાવ હોય તો તેને સેલ્સીયસમાં ફેરવો.

(A) 38°C (B) 40°C

(C) – 40°C (D) – 38°C

025. નીચેનામાંથી કયા તરંગો વિદ્યુત ચુંબકીય તરંગો નથી ?

(A) ધ્વનીના તરંગો (B) પ્રકાશના તરંગો

(C) ગામા તરંગો (D) માઈક્રો તરંગો

026. પ્રકાશના તરંગો એ કયા પ્રકારના તરંગો છે ?

(A) સંગત (B) લંબગત

(C) (A) અને (B) બન્ને (D) ઉપરોક્ત પૈકી એક પણ નહીં

027. ધ્વનીના તરંગોની આવૃત્તિ 2kHz હોય અને તેની તરંગ લંબાઈ 2m છે. તો ધ્વની તરંગોના વેગ (ઝડપ) શું થાય ?

(A) 2000 m/s (B) 400 m/s

(C) 200 m/s (D) 4000 m/s

028. ..... એ લેસરની લાક્ષણીકતા નથી.

(A) સુસંબદ્ધતા (B) એકરંગી

(C) વાંકુ વળવું (ડાઈવર્ટ થવું) (D) ઉંચી તીવ્રતા

029. ઓપ્ટીકલ ફાઈબર ..... ના હેતુ પર કાર્ય કરે છે.

(A) પૂર્ણ આંતરીક પરાવર્તન (B) ધ્રુવીભવન

(C) વક્રિભવન (D) વિવર્તન

030. એક સભાગૃહનું કદ 6000 m^3 છે. તેની સપાટીઓ વડે થતું કુલ શોષણ 1000 O.W.U. છે. તો પ્રતિઘોષ સમય શોધો.

(A) 9 સેકન્ડ (B) 0.966 સેકન્ડ

(C) 90 સેકન્ડ (D) 9.6 સેકન્ડ

020. At what temperature are Celsius and Fahrenheit equal?

(A) 40°C (B) 40°F

(C) –40°C and –40°F (D) None of above

021. Unit of heat capacity is _____

(A) J/K (B) Cal/K

(C) Cal/°C (D) All of above

022. With rising temperatures, the thermal conductivity will be _____

(A) Decreased (B) Increased

(C) Remain constant (D) Zero

023. The mathematical formula of specific heat is _____

(A) $C = Q / m\Delta T$ (B) $Q = C / m\Delta T$

(C) $Hc = Q / \Delta L$ (D) $Q = Hc / \Delta L$

024. A person is having temperature of 104° F. Convert it in Celsius.

(A) 38°C (B) 40°C

(C) – 40°C (D) – 38°C

025. Which of the following is not a type of electromagnetic wave ?

(A) Sound wave (B) Light wave

(C) Gamma Ray (D) Micro wave

026. Which type of wave is a light wave ?

(A) Longitudinal (B) Transverse

(C) Both (A) and (B) (D) None of the above

027. The frequency of sound wave is 2kHz and it's wave length is 2m. What is the speed of sound wave?

(A) 2000 m/s (B) 400 m/s

(C) 200 m/s (D) 4000 m/s

028. _____ is not the characteristics of LASER.

(A) Coherent (B) Monochromatics

(C) Divergent (D) High intensity

029. Optical fibre works on the principle of _____

(A) Total internal reflection (B) Polarization

(C) Refraction (D) Differaction

030. A volume of an auditorium is 6000 m^3. The total absorption by the surfaces is 1000 O.W.U. Then calculate reverberation time.

(A) 9 second (B) 0.966 second

(C) 90 second (D) 9.6 second

031. કોલસાનું સળગવું એ કેવા પ્રકારની પ્રક્રિયા ગણાય છે ?

(A) દ્વિવિસ્થાપન **(B)** વિઘટન

(C) સંયોગીકરણ **(D)** વિસ્થાપન

032. $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(aq)} + NaCl_{(aq)}$ પ્રક્રિયાનો પ્રકાર કયો છે ?

(A) સંયોગીકરણ **(B)** દ્વિ-વિસ્થાપન

(C) વિઘટન **(D)** ઉપરોક્ત પૈકી એક પણ નહીં

033. જસતની સલ્ફ્યુરિક એસિડ સાથેની પ્રક્રિયાથી ઝિંક સલ્ફેટ અને હાઈડ્રોજન મળે છે. આ રાસાયણિક ફેરફાર માટેનું સમતોલિત સમીકરણ કયું છે ?

(A) $Zn + 2H_2SO_4 \rightarrow 2ZnSO_4 + H_2$ **(B)** $2Zn + H_2SO_4 \rightarrow ZnSO_4 + 2H_2$

(C) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ **(D)** ઉપરોક્ત પૈકી એક પણ નહીં

034. દાંતનું બહારનું પડ શાનું બનેલું હોય છે ?

(A) કેલ્શિયમ નાઈટ્રેટ **(B)** પોટેશિયમ ફોસ્ફેટ

(C) કેલ્શિયમ ક્લોરાઈડ **(D)** કેલ્શિયમ ફોસ્ફેટ

035. કયા ક્ષારની જલીય દ્રાવણની **pH 7.0** હોય છે ?

(A) KNO_3 **(B)** NH_4Cl

(C) CH_3COONa **(D)** Na_2CO_3

036. ધાતુ ઓક્સાઈડ + એસિડ → __?__

(A) બેઈઝ + પાણી **(B)** ક્ષાર + પાણી

(C) એસિડ + ક્ષાર **(D)** ઉપરોક્ત પૈકી એક પણ નહીં

037. સોડિયમ ઝિંકેટનું અણુસૂત્ર લખો.

(A) Na_2ZnO_3 **(B)** Na_2ZnO_2

(C) $NaZnO_2$ **(D)** $Na_2Zn_2O_2$

038. ફ્લોરિનની બાહ્યતમ કક્ષામાં કેટલા ઈલેક્ટ્રોન હોય છે ?

(A) 9 **(B)** 7

(C) 2 **(D)** 5

039. નીચેના પૈકી કઈ પદ્ધતિ લોખંડની સાંતળવાની તવીને કાટ લાગવાથી અટકાવી શકે છે ?

(A) ગ્રીઝ લગાવવાની **(B)** રંગ લગાવવાની

(C) ઝિંકનું સ્તર લગાવવાની **(D)** ઉપરોક્ત તમામ

040. સૌથી વધુ ટીપી શકાય તેવી ધાતુ કઈ છે ?

(A) સોનું **(B)** સીસું

(C) (A) અને (B) બન્ને **(D)** ઉપરોક્ત પૈકી એક પણ નહીં

031. Burning of coal is a which type of process ?

(A) Double displacement (B) Decomposition

(C) Combination (D) Displacement

032. $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(aq)} + NaCl_{(aq)}$. Which type of reaction is this?

(A) Combination (B) Double displacement

(C) Decomposition (D) None of these

033. Reaction of Zinc with Sulphuric acid gives Zinc Sulphate and Hydrogen. Which is the balanced equation for this chemical Change ?

(A) $Zn + 2H_2SO_4 \rightarrow 2ZnSO_4 + H_2$ (B) $2Zn + H_2SO_4 \rightarrow ZnSO_4 + 2H_2$

(C) $Zn + H_2SO_4 \rightarrow ZnSO_4 + H_2$ (D) None of these

034. The outer layer of the teeth is made-up of _____

(A) Calcium nitrate (B) Potassium phosphate

(C) Calcium chloride (D) Calcium phosphate

035. The pH of aqueous solution of which salt is 7.0 ?

(A) KNO_3 (B) NH_4Cl

(C) CH_3COONa (D) Na_2CO_3

036. Metal oxide + Acid → __?__

(A) Base + Water (B) Salt + Water

(C) Acid + Salt (D) None of these

037. State the molecular formula of Sodium Zincate.

(A) Na_2ZnO_3 (B) Na_2ZnO_2

(C) $NaZnO_2$ (D) $Na_2Zn_2O_2$

038. How many electrons are present in the outermost shell of fluorine?

(A) 9 (B) 7

(C) 2 (D) 5

039. Which of the following methods is suitable for preventing an iron frying pan from rusting ?

(A) Applying grease (B) Applying paint

(C) Applying a coating of zinc (D) All of the above

040. Which of following metals is highly malleable?

(A) Gold (B) Lead

(C) Both (A) and (B) (D) None of these

041. ..... યોગ્ય (valid) ડેટા (data) type MS-Excel માં નથી.

(A) Number (B) Character

(C) Label (D) Date / Time

042. MS-PowerPoint માં વધુમાં વધુ (maximum) zoom કેટલા ટકા કરી શકાય ?

(A) 400 (B) 300

(C) 200 (D) 100

043. નીચે પૈકી કયું MS-Word માં નથી ?

(A) Italic (B) Magic Tool

(C) Font (D) Bold

044. CPU શેનું બનેલું છે ?

(A) ALU + CU (B) ROM + ALU

(C) RAM + ROM (D) ઉપરોક્ત પૈકી એક પણ નહીં

045. નીચે પૈકી માંથી કયું OS (Operating System) નથી ?

(A) UNIX (B) MS-DOS

(C) LINUX (D) Microsoft Office

046. કયું પ્રદુષક સામાન્ય રીતે શિશુઓમાં ''બ્લુ બેબી સિન્ડ્રોમ'' સાથે સંકળાયેલું છે ?

(A) સીસુ (B) આર્સેનિક

(C) પારો (D) નાઈટ્રેટ

047. વાતાવરણના ..... સ્તરમાં વાદળો હાજર હોય છે.

(A) ઊર્ધ્વમંડળ (B) ટ્રોપોસ્ફિયર

(C) મેસોસ્ફિયર (D) થર્મોસ્ફિયર

048. રેફ્રિજરેટરમાં સીએફસીનો ઉપયોગ કરવાની ભલામણ કરવામાં આવતી નથી કારણકે તે ..... કરે છે.

(A) તાપમાન વધારો (B) પર્યાવરણને અસર

(C) ઓઝોન સ્તરને ક્ષીણ (D) માનવ શરીરને અસર

049. સૂર્ય પ્રકાશને વીજળીમાં રૂપાંતરિત કરવામાં આધુનિક સૌર ફોટો વોલ્ટેઈક (PV) પેનલ્સની અંદાજીત કાર્યક્ષમતા શ્રેણી કેટલી છે ?

(A) 5 - 10% (B) 15 - 20%

(C) 20 - 30% (D) 40 - 50%

050. મનુષ્યમાં શ્વસન સંબંધી સમસ્યાઓ અને કાર્ડિયોવેસ્ક્યુલર રોગો માટે કયું પ્રદુષક મુખ્યત્વે જવાબદાર છે ?

(A) લીડ (B) બેન્ઝીન

(C) પાર્ટિક્યુલેટ મેટર (PM10) (D) કાર્બન મોનોક્સાઈડ (CO)

041. _____ is not valid data type in MS-Excel ?

(A) Number (B) Character

(C) Label (D) Date/Time

042. What is the max zoom percentage in MS-PowerPoint?

(A) 400 (B) 300

(C) 200 (D) 100

043. Which is not in MS-Word ?

(A) Italic (B) Magic tool

(C) Font (D) Bold

044. CPU consist of

(A) ALU + CU (B) ROM + ALU

(C) RAM + ROM (D) None of the above

045. Which of the following is not OS (Operating System)

(A) UNIX (B) MS-DOS

(C) LINUX (D) Microsoft Office

046. Which pollutant is commonly associated with "blue baby Syndrome" in infants?

(A) Lead (B) Arsenic

(C) Mercury (D) Nitrate

047. Clouds are present in _____ layer of atmosphere.

(A) Stratosphere (B) Troposphere

(C) Mesosphere (D) Thermosphere

048. CFCs are not recommended to be used in refrigerators because they _____

(A) Increase temperature (B) Affect environment

(C) Deplete ozone (D) Affect human body

049. What is the approximate efficiency range of modern solar photovoltaic (PV) panels in converting Sunlight in to electricity?

(A) 5 - 10% (B) 15 - 20%

(C) 20 - 30% (D) 40 - 50%

050. Which pollutant is primarily responsible for causing respiratory problems and cardiovascular diseases in humans?

(A) Lead (B) Benzene

(C) Particulate matter (PM10) (D) Carbon Monoxide (CO)

SECTION - 2

051. જો $A=\begin{bmatrix}1 & -1\\ 1 & 2\end{bmatrix}$ અને $B=\begin{bmatrix}2 & 1\\ -1 & 3\end{bmatrix}$ હોય તો $(AB)^T =$ _____ થાય.

(A) $\begin{bmatrix}3 & -2\\ 7 & 0\end{bmatrix}$ (B) $\begin{bmatrix}3 & 0\\ -2 & 7\end{bmatrix}$

(C) $\begin{bmatrix}3 & -2\\ 0 & 7\end{bmatrix}$ (D) $\begin{bmatrix}3 & 0\\ 7 & -2\end{bmatrix}$

052. જો $A=\begin{bmatrix}1 & 2 & 1\\ 2 & 1 & 3\\ 1 & 1 & 0\end{bmatrix}$ હોય તો $|A| =$ _____ થાય.

(A) -3 (B) 3

(C) -4 (D) 4

053. જો $A=\begin{bmatrix}2 & -1\\ 3 & 1\end{bmatrix}$ હોય તો $A^{-1} =$ _____ થાય.

(A) $\frac{1}{5}\begin{bmatrix}1 & 1\\ -3 & 2\end{bmatrix}$ (B) $\frac{1}{5}\begin{bmatrix}2 & 1\\ -3 & 1\end{bmatrix}$

(C) $\frac{1}{5}\begin{bmatrix}1 & -1\\ 3 & 2\end{bmatrix}$ (D) $\frac{1}{5}\begin{bmatrix}-2 & 3\\ -1 & -1\end{bmatrix}$

054. જો $A=\begin{bmatrix}2 & -1\\ 1 & 0\end{bmatrix}$ અને $B=\begin{bmatrix}1 & 0\\ 2 & 3\end{bmatrix}$ હોય તો $3B-2A =$ _____ થાય.

(A) $\begin{bmatrix}4 & -3\\ -1 & 6\end{bmatrix}$ (B) $\begin{bmatrix}4 & -3\\ -1 & -6\end{bmatrix}$

(C) $\begin{bmatrix}-1 & 2\\ 4 & -9\end{bmatrix}$ (D) $\begin{bmatrix}-1 & 2\\ 4 & 9\end{bmatrix}$

055. $\text{Sin}(225°) =$ _____

(A) $\frac{-1}{\sqrt{2}}$ (B) $\frac{1}{\sqrt{2}}$

(C) $\frac{\sqrt{3}}{2}$ (D) $\frac{-1}{2}$

SECTION - 2

051. If $A=\begin{bmatrix}1 & -1\\ 1 & 2\end{bmatrix}$ and $B=\begin{bmatrix}2 & 1\\ -1 & 3\end{bmatrix}$ then$(AB)^{T}$ = _____ .

(A) $\begin{bmatrix}3 & -2\\ 7 & 0\end{bmatrix}$ (B) $\begin{bmatrix}3 & 0\\ -2 & 7\end{bmatrix}$

(C) $\begin{bmatrix}3 & -2\\ 0 & 7\end{bmatrix}$ (D) $\begin{bmatrix}3 & 0\\ 7 & -2\end{bmatrix}$

052. If $A=\begin{bmatrix}1 & 2 & 1\\ 2 & 1 & 3\\ 1 & 1 & 0\end{bmatrix}$ then $|A|$ = _____ .

(A) -3 (B) 3

(C) -4 (D) 4

053. If $A=\begin{bmatrix}2 & -1\\ 3 & 1\end{bmatrix}$ then A^{-1} = _____ .

(A) $\frac{1}{5}\begin{bmatrix}1 & 1\\ -3 & 2\end{bmatrix}$ (B) $\frac{1}{5}\begin{bmatrix}2 & 1\\ -3 & 1\end{bmatrix}$

(C) $\frac{1}{5}\begin{bmatrix}1 & -1\\ 3 & 2\end{bmatrix}$ (D) $\frac{1}{5}\begin{bmatrix}-2 & 3\\ -1 & -1\end{bmatrix}$

054. If $A=\begin{bmatrix}2 & -1\\ 1 & 0\end{bmatrix}$ and $B=\begin{bmatrix}1 & 0\\ 2 & 3\end{bmatrix}$ then $3B-2A$ = _____ .

(A) $\begin{bmatrix}4 & -3\\ -1 & 6\end{bmatrix}$ (B) $\begin{bmatrix}4 & -3\\ -1 & -6\end{bmatrix}$

(C) $\begin{bmatrix}-1 & 2\\ 4 & -9\end{bmatrix}$ (D) $\begin{bmatrix}-1 & 2\\ 4 & 9\end{bmatrix}$

055. $Sin(225°)$ = _____

(A) $\frac{-1}{\sqrt{2}}$ (B) $\frac{1}{\sqrt{2}}$

(C) $\frac{\sqrt{3}}{2}$ (D) $\frac{-1}{2}$

056. જો $\tan\theta = -\frac{12}{5}, \frac{3\pi}{2} < \theta < 2\pi$ હોય તો $\cos\theta =$ _____ થાય.

(A) $\frac{-12}{13}$ (B) $\frac{12}{13}$

(C) $\frac{5}{13}$ (D) $\frac{-5}{13}$

057. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) =$ _____

(A) $\frac{2\pi}{3}$ (B) $\frac{-\pi}{6}$

(C) $\frac{5\pi}{3}$ (D) $\frac{5\pi}{6}$

058. જો $|\bar{x} \times \bar{y}| = |\bar{x}| = |\bar{y}| = \sqrt{2}$ તો $(\bar{x}, \hat{\ } \bar{y}) =$ _____ થાય.

(A) $\frac{\pi}{3}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{6}$ (D) $\frac{\pi}{2}$

059. જો સદિશો (2, 3, a) અને (3, –1, 4) પરસ્પર લંબ હોય તો $a =$ _____ થાય.

(A) $\frac{-3}{4}$ (B) $\frac{3}{4}$

(C) $\frac{4}{3}$ (D) $\frac{-4}{3}$

060. જો વર્તુળ $x^2 + y^2 - 6my + 11 = 0$ નું કેન્દ્ર (0, –3) હોય તો $m =$ _____ થાય.

(A) 2 (B) –2

(C) 1 (D) –1

061. બિંદુઓ (1, –1) અને (–1, 1) માંથી પસાર થતી રેખાનું સમીકરણ _____ થાય.

(A) $2x + y - 1 = 0$ (B) $x + 2y - 1 = 0$

(C) $x + y = 0$ (D) $x + 2y + 1 = 0$

056. If $\tan\theta = -\frac{12}{5}, \frac{3\pi}{2} < \theta < 2\pi$ then $\cos\theta =$ _____ .

(A) $\frac{-12}{13}$ (B) $\frac{12}{13}$

(C) $\frac{5}{13}$ (D) $\frac{-5}{13}$

057. $\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right) =$ _____

(A) $\frac{2\pi}{3}$ (B) $\frac{-\pi}{6}$

(C) $\frac{5\pi}{3}$ (D) $\frac{5\pi}{6}$

058. If $\left|\bar{x} \times \bar{y}\right| = \left|\bar{x}\right| = \left|\bar{y}\right| = \sqrt{2}$ then $\left(\bar{x}, \hat{} \bar{y}\right) =$ _____.

(A) $\frac{\pi}{3}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{6}$ (D) $\frac{\pi}{2}$

059. If vectors (2, 3, *a*) and (3, –1, 4) are prependicular then *a* = _____.

(A) $\frac{-3}{4}$ (B) $\frac{3}{4}$

(C) $\frac{4}{3}$ (D) $\frac{-4}{3}$

060. If the centre of the circle $x^2 + y^2 - 6my + 11 = 0$ is (0, –3) then *m* = _____.

(A) 2 (B) –2

(C) 1 (D) –1

061. Equation of line passing through the points (1, –1) and (–1, 1) is _____ .

(A) $2x + y - 1 = 0$ (B) $x + 2y - 1 = 0$

(C) $x + y = 0$ (D) $x + 2y + 1 = 0$

062. $\lim_{x \to 0}\left(\frac{10^x - 5^x}{x}\right) =$ _____

(A) $\log_e\left(\frac{1}{2}\right)$ (B) $\log_e(10)$

(C) $\log_e(5)$ (D) $\log_e(2)$

063. $\lim_{n \to \infty}\frac{3n^2 - 11n - 13}{(4n-5)(7-6n)} =$ _____

(A) $\frac{1}{4}$ (B) $\frac{-1}{8}$

(C) $\frac{1}{6}$ (D) $\frac{-1}{4}$

064. જો $f(x) = \log_4(x)$ હોય તો $f(64) =$ _____ થાય.

(A) 3 (B) –3

(C) 6 (D) $\frac{1}{3}$

065. $\frac{d}{dx}(\cos^2 x) =$ _____

(A) $\sin 2x$ (B) $-\sin 2x$

(C) $\cos 2x$ (D) $-\cos 2x$

066. $\frac{d}{dx}\left[\log\left(\sqrt{x^2-9}\right)\right] =$ _____

(A) $\frac{1}{\sqrt{x^2-9}}$ (B) $\frac{x}{\sqrt{x^2-9}}$

(C) $\frac{9}{x^2-9}$ (D) $\frac{x}{x^2-9}$

067. જો $x = cosec\ \theta$ અને $y = cot\ \theta$ હોય તો $\frac{dy}{dx} =$ _____ થાય.

(A) sec θ (B) cosec θ

(C) sin θ (D) cos θ

068. વિધેય $f(x)$ એ $x = a$ આગળ ન્યૂનતમ બને તે માટેની શરત _____ છે.

(A) $f''(a) > 0$ (B) $f''(a) < 0$

(C) $f'(a) > 0$ (D) $f'(a) < 0$

062. $\lim_{x \to 0}\left(\frac{10^x - 5^x}{x}\right) =$ _____

(A) $\log_e\left(\frac{1}{2}\right)$ (B) $\log_e(10)$

(C) $\log_e(5)$ (D) $\log_e(2)$

063. $\lim_{n \to \infty}\frac{3n^2 - 11n - 13}{(4n-5)(7-6n)} =$ _____

(A) $\frac{1}{4}$ (B) $\frac{-1}{8}$

(C) $\frac{1}{6}$ (D) $\frac{-1}{4}$

064. If $f(x) = \log_4(x)$ then $f(64) =$ _____.

(A) 3 (B) –3

(C) 6 (D) $\frac{1}{3}$

065. $\frac{d}{dx}(\cos^2 x) =$ _____

(A) $\sin 2x$ (B) $-\sin 2x$

(C) $\cos 2x$ (D) $-\cos 2x$

066. $\frac{d}{dx}\left[\log\left(\sqrt{x^2 - 9}\right)\right] =$ _____

(A) $\frac{1}{\sqrt{x^2 - 9}}$ (B) $\frac{x}{\sqrt{x^2 - 9}}$

(C) $\frac{9}{x^2 - 9}$ (D) $\frac{x}{x^2 - 9}$

067. If $x = cosec\ \theta$ and $y = cot\ \theta$ then $\frac{dy}{dx}$ = _____.

(A) sec θ (B) cosec θ

(C) sin θ (D) cos θ

068. The necessary condtion for the function $f(x)$ to be minimum at $x = a$ is _____.

(A) $f''(a) > 0$ (B) $f''(a) < 0$

(C) $f'(a) > 0$ (D) $f'(a) < 0$

069. $\int \cos(10x-17)\,dx = \_\_\_\_\_ + c$

(A) $10\sin(10x-17)$ (B) $-10\sin(10x-17)$

(C) $\frac{1}{10}\sin(10x-17)$ (D) $-\frac{1}{10}\sin(10x-17)$

070. $\int_{-1}^{1} \sin^5 x.\cos^8 x\,dx = \_\_\_\_\_$

(A) –1 (B) 0

(C) 1/2 (D) 1/4

071. $\int e^x(\cos ec^2 x - \cot x)\,dx = \_\_\_\_\_ + c$

(A) $e^x.\cos ec^2 x$ (B) $-e^x.\cos ec^2 x$

(C) $e^x.\cot x$ (D) $-e^x.\cot x$

072. $\int \frac{x-3}{x^2-6x+40}\,dx = \_\_\_\_\_ + c$

(A) $\frac{1}{2}\log|x^2-6x+40|$ (B) $-\frac{1}{2}\log|x^2-6x+40|$

(C) $2\log|x^2-6x+40|$ (D) $-2\log|x^2-6x+40|$

073. $\log_{\frac{1}{81}}\left(\frac{1}{9}\right) = \_\_\_\_\_$

(A) 9 (B) 1/9

(C) 1/2 (D) –1/2

074. $4^{\log_2 3} + 2^{\log_8 27} = \_\_\_\_\_$

(A) 9 (B) 10

(C) 11 (D) 12

075. જો 19, 15, 12, k, 8, 3 નો મધ્યક 11 હોય તો k = _____ થાય.

(A) 8 (B) 9

(C) 10 (D) 11

069. $\int \cos(10x-17)\,dx = \_\_\_\_\_ + c$

(A) $10\sin(10x-17)$ (B) $-10\sin(10x-17)$

(C) $\frac{1}{10}\sin(10x-17)$ (D) $-\frac{1}{10}\sin(10x-17)$

070. $\int_{-1}^{1} \sin^5 x.\cos^8 x\,dx = \_\_\_\_\_$

(A) –1 (B) 0

(C) 1/2 (D) 1/4

071. $\int e^x(\cos ec^2 x - \cot x)\,dx = \_\_\_\_\_ + c$

(A) $e^x.\cos ec^2 x$ (B) $-e^x.\cos ec^2 x$

(C) $e^x.\cot x$ (D) $-e^x.\cot x$

072. $\int \frac{x-3}{x^2-6x+40}\,dx = \_\_\_\_\_ + c$

(A) $\frac{1}{2}\log|x^2-6x+40|$ (B) $-\frac{1}{2}\log|x^2-6x+40|$

(C) $2\log|x^2-6x+40|$ (D) $-2\log|x^2-6x+40|$

073. $\log_{\frac{1}{81}}\left(\frac{1}{9}\right) =$ _____

(A) 9 (B) 1/9

(C) 1/2 (D) –1/2

074. $4^{\log_2 3} + 2^{\log_8 27} =$ _____

(A) 9 (B) 10

(C) 11 (D) 12

075. If the mean of the observations 19, 15, 12, *k*, 8, 3 is 11 then *k* = _____.

(A) 8 (B) 9

(C) 10 (D) 11

* **Read the following passage carefully and answer the questiosn : (Q.No. 076 to 080)**

The science of fireworks is technically called 'pyrotechnics' - from the Greek word 'pyr' meaning fire and 'technics' meaning an art. Pyrotechnics includes not only fireworks but also a whole range of devices that use similar materials and principles, from safety matches that we use every day to solid fuel rocket boosters of space shuttle. The household match is considered a special pyrotechnic device, as all the pyrotechnic effect - heat, smoke, light, gas and sound are present in it.

Some historians say that 'black powder', the basic material used in fireworks, was invented in India. Shukranti, written more than two thousand years ago, has references to weapons similar to guns and projectile weapons. However, the Chinese are generally considered the pioneers of pyrotechnics. They are said to have developed, black powered more than one thousand years ago. It took at least two thousand years for the knowledge to spread to the West, and it was only in 1242 that an English Monk, Roger Bacon, revealed the formula for "black powder". He considered it such a dangerous substance that he wrote of it in a code language.

076. As per some historians 'Black Powder' was invented in _____

(A) India **(B) China**

(C) Greek **(D) None of the above**

077. Roger Bacon was

(A) a Chinese writer **(B) an Indian historian**

(C) an English Monk **(D) a Greek philosopher**

078. Who wrote about 'Black Powder' in code language?

(A) Shukranti **(B) Roger Bacon**

(C) Chinese **(D) Greek**

079. When was Shukranti written?

(A) One thousand years ago **(B) In 1242**

(C) Two thousand years ago **(D) Modern times**

080. Pyrotechnics word is from

(A) Indian language **(B) Greek language**

(C) Chinese language **(D) None of the above**

081. Verbal communication can be in _____ form.

(A) written (B) oral and written

(C) oral (D) none of these

082. Tone of voice, voice quality, style of speaking, stress, intonation are part of _____

(A) body language (B) sign language

(C) paralanguage (D) code language

083. The process of communication is a _____

(A) two way (B) three way

(C) one way (D) single way

084. "During the process of communication at every stage, there is hindrance which disturbs communication process." Such hindrance is known as

(A) barrier (B) noise

(C) sender (D) receiver

085. Our physical appearance is an example of _____ communication

(A) oral (B) written

(C) verbal (D) non-verbal

086. What is written at the top of a business letter on the left hand side.

(A) Sender's address (B) Receiver's address

(C) Date (D) Salutation

087. Where is the salutation placed in a business letter?

(A) Just above the date (B) Just below the date

(C) Along with the subject (D) None of these

088. Which of the following is not a part of the business letter?

(A) Photo **(B) Salutation**

(C) Date **(D) Signature**

089. A letter is incomplete and worthless without _____

(A) Signature **(B) Postscript**

(C) Enclosure **(D) Photo**

090. Give the full form of C.O.D.

(A) Cash on delay **(B) Cash on delivery**

(C) Cash on order **(D) Cash on distance**

091. Hurrah! I have passed the examination. Identify the interjection.

(A) Examination **(B) Passed**

(C) Hurrah! **(D) The whole sentence.**

092. The dog is sitting _____ the cot. Select appropriate option.

(A) under **(B) into**

(C) between **(D) up**

093. The Sun _____ in the East. Select appropriate option

(A) raise **(B) rises**

(C) rise **(D) raised**

094. Your family _____ a happy family. Select appropriate option

(A) are **(B) is**

(C) has **(D) have**

095. Do you have _____ doubt in this question paper? Select appropriate option.

(A) some **(B) any**

(C) many **(D) much**

096. Select the correct spelling

(A) Playwright **(B) Playwrite**

(C) Playright **(D) Playrite**

097. Select the correct spelling

(A) Enterpeneur **(B) Entrepreneur**

(C) Enterpreneur **(D) Entrepeneur**

098. Choose the correct grammatical sentence.

(A) People were coming, going and ignorant him.

(B) People were coming, going and ignoring him.

(C) People where coming, going and ignoring him

(D) People were coming, going and ignored him.

099. Choose the correct grammatical sentence

(A) I like drawing my coworkers and my cat.

(B) I Like drawing, my coworkers and my cat.

(C) I like drawing, my coworkers, and, my cat.

(D) I, Like, drawing, my coworkers, and, my, cat.

100. Choose the correct grammatical sentence.

(A) The ship was wrecked, and every man, woman and child have drowned.

(B) The ship was wrecked, and every man, woman, and child are drowned.

(C) The ship was wrecked, and every man, woman and child is drowned.

(D) The ship was wrecked, and every man, woman and child was drowned.

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