

International Islamic University, Islamabad

Department of Physics Entrance Test Session Fall 2013

Candidate's Name:

Time Allowed: 2 hrs

Father's Name:

Roll no.:

Signature:

Instructions

1. Attempt all the questions
2. All questions carry equal marks (section A; 1 Mark each, Section B; 7 Marks each)
3. Lead pencil is not allowed to answer the questions
4. Any attempt to copy answer from another candidate will result in permanent disbarment from the University for all purposes.
5. Use your own calculator. No permission for borrowing from others.

Entry Test Fall 2013

➤ **Directions—(Q. 1—5)**

Which of the phrases (A), (B), (C) and (D), given below each sentence, should replace the phrase printed in bold type to make the sentence grammatically correct? If the sentence is correct as it is, mark (E) i.e. 'No correction required' as the answer.

Q1. The inquiry found that both the secretary and the treasurer had been **negligent in their duties**.

- (A) neglecting his duty
- (B) neglected by their duties
- (C) neglecting in their duty
- (D) negligence for their duties
- (E) No correction required

Q2. He arrived at the hotel, **which a reception was** held in his honor.

- (A) in which a reception is
- (B) while a reception being
- (C) where a reception was
- (D) since a reception going on
- (E) No correction required

Q3. Since his college days he has been **standing up with** the rights of the weak and the oppressed.

- (A) Stood up along with
- (B) standing in for
- (C) for standing beside
- (D) standing up for
- (E) No correction required

Q4. **Unless a man with** plenty of money can afford a house in this locality.

- (A) Until a man has
- (B) when a man possesses
- (C) except a man of
- (D) only a man with
- (E) No correction required

Q5. The sales conference **cannot be began** till the festive season is over.

- (A) cannot have beginning
- (B) unable to begin
- (C) cannot begin
- (D) has no beginning
- (E) No correction required

➤ Directions—(Q. 6—10) Pick out the most effective word, from the given words, to fill in the blank to make the sentence meaningful and complete.

Q6. You must ensure the correctness of the information before..... to conclusion.

- (A) Drawing
- (B) Enabling
- (C) Leaning
- (D) Jumping
- (E) Examining

Q7. The rocket..... the target and did not cause any casualty.

- (A) Sensed
- (B) Reached
- (C) Missed
- (D) Exploded
- (E) Aimed

Q8. It is desirable to take..... in any business if you want to make profit.

- (A) Advice
- (B) Risk
- (C) Loan
- (D) Perseverance
- (E) Recourse

Q9. They wasted all the money on purchase of some..... items.

- (A) Excellent
- (B) Important
- (C) Significant
- (D) Quality
- (E) Trivial

Q10. When he found the wallet his face glowed but soon it faded as the wallet was.....

- (A) Empty
- (B) Vacant
- (C) Recovered
- (D) Stolen
- (E) Expensive

- In the following questions, choose the one which best expresses the meaning of the given word.

Q11. EMPIRICAL

- A. Spiritual
- B. Royal
- C. Practical
- D. Theoretical

Q12. INTERROGATE

- A. To interfere
- B. To question
- C. To stop
- D. To enter the gate

Q13. SIMULATE

- A. Presume
- B. Warn
- C. Imitate
- D. Take

Q14.COY

- A. Beautiful
- B. Sweet
- C. Talented
- D. Shy

Q15. PROCURE

- A. Obtain
- B. Endanger
- C. Incur
- D. Rescue

➤ **Directions: Choose ANTONYMS to the given word.**

Q16. REPEL

- A. Attract
- B. Concentrate
- C. Attend
- D. Continue

Q17. FACTITIOUS

- A. Ridiculous
- B. Genuine
- C. Engineered
- D. Magnificent

Q18. REJECT

- A. Agree
- B. Accept
- C. Embrace
- D. Adopt

Q19. FILTHY

- A. Stainless
- B. Shining
- C. Sterilized
- D. Clean

Q20. DIM

- A. Bright
- B. Understandable
- C. Loud
- D. Clear

➤ **Directions: In the following questions find the one word Substitution from the given options**

Q21. A person who is against the standards of ordinary society especially in dressing

- (A) Joker
- (B) Hippy
- (C) Scapegoat
- (D) Butt

Q22. An animal story with a moral

- (A) Fable
- (B) Tale
- (C) Anecdote
- (D) Parable

Q23. Having no beginning or end to its existence

- (A) Eternal
- (B) Obscure
- (C) Universal
- (D) Immeasurable

Q24. Acutely affected by external impressions

- (A) Ingenious
- (B) Impressionable
- (C) Credulous
- (D) Sensitive

Q25. A story in which ideas are symbolized as people

- (A) Allegory
- (B) Fable
- (C) Legend
- (D) Parable

➤ **Directions:** In the following questions, sentences are given with blanks to be filled in with an appropriate and suitable word. Four alternatives are suggested for each question. Choose the correct alternative out of the four and choose the correct alternative.

Q26. The streets are lighted electricity.

- (A) With
- (B) by
- (C) on
- (D) in

Q27. The chairman, as well as the members, to blame for this misfortune.

- (A) are
- (B) were
- (C) is
- (D) has

Q28. My friends fail to see why I should ride the horse just because I have won a prize.

- (A) Great
- (B) good
- (C) big
- (D) high

Q29. She feared that she

- (A) Will fail
- (B) may fail
- (C) might have fail
- (D) would fail

Q30. 'Abundance' means—

- (A) Long life
- (B) happiness
- (C) plenty
- (D) permanent

Section B: Physics (70 marks)

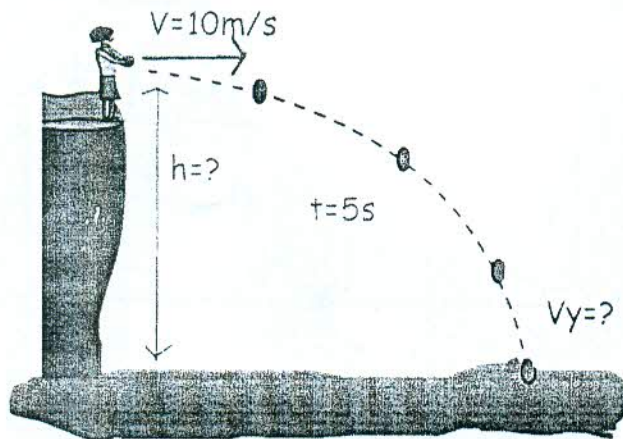
Q. 1: A particle of mass m is moving in a horizontal circle of radius r , under a centripetal force equal to $(-k/r^2)$ where k is constant. What is the total energy of the particle?

Q. 2: A 5.0-kg ball is at rest 150 meters above the ground before it is dropped. If we neglect air resistance, find the speed of the ball just before it strikes the ground.

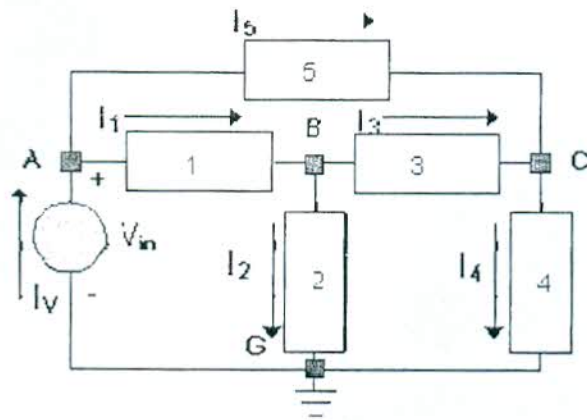
Q. 3: A Carnot's engine whose low temperature reservoir is at 27°C has an efficiency of 40%. What should be the temperature of high temperature reservoir? What should be the temperature of the latter if the efficiency is to be raised to 60%?

Q. 4: A Carnot's engine working between 0°C and 100°C takes up 840 joules from the high temperature reservoir. Calculate the work done, heat rejected and the efficiency.

Q. 5: In the given picture below, Alice throws the ball to the +X direction with an initial velocity 10m/s. Time elapsed during the motion is 5s, calculate the height that object is thrown and V_y component of the velocity after it hits the ground.



Q. 6: Write the expressions of Kirchoff's current law for node A, B and C,



Node A:

Node B:

Node C:

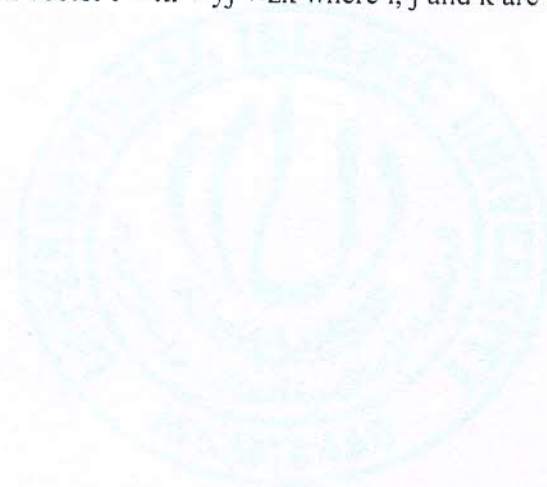
Node G:

Q. 7: Two radioactive materials. X_1 and X_2 have decay constants 10λ respectively. If initially they have the same number of nuclei, then the ratio of the number of nuclei of X_1 to that of X_2 , will be $1/e$. Find the time for this ratio.

Q. 8: Calculate the de-broglie wavelength of the stone of mass 0.1 Kg moving at a speed of 5 ms^{-1} .

Q.9: A block of mass $m = 3.63 \text{ kg}$ slides on a horizontal frictionless table with a speed of $v = 1.22 \text{ m/s}$. It is brought to rest in compressing a spring in its path. By how much is the spring compressed if the force constant is 135 N/m .

Q.10: Given a position vector $\mathbf{r} = x\mathbf{i} + y\mathbf{j} + z\mathbf{k}$ where \mathbf{i} , \mathbf{j} and \mathbf{k} are the unit vectors. Evaluate $\text{Div } \mathbf{r}$ and $\text{curl } \mathbf{r}$.



University of Islamabad, Islamabad

Department of Mathematics

Faculty of Science

Islamabad