अनुकम्पा के आधार पर समूह ग में तकनीकी स्तर जेइं ग्रेड पे 4200/– (बीटेक इन मैकेनिकल इंजी0) पद पर नियुक्ति हेतु सुयोग्यता परीक्षा का प्रश्न–पत्र

समय– 02 घंटा 30 मिनट दिनांक – 25.11.2020 पूर्णांक – 100

नोट : 1–उत्तर में किसी प्रकार की कटिंग, ओवर राइटिंग, Erase, Modify करने पर उसका मूल्यांकन नहीं होगा।
2–मोबाइल का प्रयोग वर्जित है।

तकनीकी प्रश्नः– खण्ड–1 (1 x 50 = 50)
1. Unit of thermal conductivity in M.K.S. units is (a) kcal/kg m2 °C (b) kcal-m/hr m2 °C (c) kcal/hr m2 °C (d) kcal-m/hr °C (e) kcal-m/m2 °C.
2. Unit of thermal conductivity in S.I. units is (a) J/m2 sec (b) J/m °K sec (c) W/m °K (d) (a) and (c) above (e) (b) and (c) above.
3. Thermal conductivity of solid metals with rise in temperature normally (a) increases (b) decreases (c) remains constant (d) may increase or decrease depending on temperature (e) unpredictable.
4. Thermal conductivity of non-metallic amorphous solids with decrease in temperature (a) increases (b) decreases (c) remains constant (d) may increase or decrease depending on temperature (e) unpredictable.
5. Heat transfer takes place as per – (a) zeroth law of thermodynamics (b) first law of thermodynamic (c) second law of the thermodynamics (d) Kirchhoff law (e) Stefan's law.
6. When heat is transferred from one particle of hot body to another by actual motion of the heated particles, it is referred to as heat transfer by (a) conduction (b) convection (c) radiation (d) conduction and convection (e) convection and radiation.
7. When heat is transferred form hot body to cold body, in a straight line, without affecting the intervening medium, it is referred as heat transfer by (a) conduction (b) convection (c) radiation (d) conduction and convection (e) convection and radiation.
8. Sensible heat is the heat required to (a) change vapour into liquid (b) change liquid into vapour (c) increase the temperature of a liquid of vapour (d) convert water into steam and superheat it (e) convert saturated steam into dry steam.
9. The insulation ability of an insulator with the presence of moisture would (a) increase (b) decrease (c) remain unaffected (d) may temperature and thickness of insulation (e) none of the above.
10. When heat is Transferred by molecular collision, it is referred to as heat transfer by (a) conduction (b) convection (c) radiation (d) scattering (e) convection and radiation.
11. Heat transfer in liquid and gases takes place by (a) conduction (b) convection (c) radiation (d) conduction and convection (e) convection and radiation.
12. Which of the following is the case of heat transfer by radiation (a) blast furnace (b) heating of building (c) cooling of parts in furnace (d) heat received by a person from fireplace (e) all of the above
13. Heat is closely related with (a) liquids (b) energy (c) temperature (d) entropy (e) enthalpy.
14. Pick up the wrong case. Heat flowing from one side to other depends directly on (a) face area (b) time (c) thickness (d) temperature difference (e) thermal conductivity

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15. Metals are good conductors of heat because
(a) their atoms collide frequently (b) their atoms-are relatively far apart
(c) they contain free electrons (d) they have high density (e) all of the above.

16. Which of the following is a case of steady state heat transfer
(a) I.C. engine (b) air preheaters (c) heating of building in winter (d) all of the above
(e) none of the above

17. Total heat is the heat required to
(a) change vapour into liquid (b) change liquid into vapour
(c) increase the temperature of a liquid or vapour (d) convert water into steam and superheat it
(e) convert saturated steam into dry steam

18. Cork is a good insulator because it has
(a) free electrons (b) atoms colliding frequency (c) low density (d) porous body
(e) all of the above

19. Thermal conductivity of water in general with rise in temperature
(a) increases (b) decreases (c) remains constant (d) may increase or decrease depending on temperature (e) none of the above

20. Thermal conductivity of water at 20°C is of the order of
(a) 0.1 (b) 0.23 (c) 0.42 (d) 0.51 (e) 0.64.

21. Temperature of steam at around 540°C canbe measured by
(a) thermometer (b) radiatiouv pyrometer (c) thermistor (d) thermocouple
(e) thermopile.

22. Thermal conductivity of air at room temperature in kcal/m hr °C is of the order of
(a) 0.002 (b) 0.02 (c) 0.01 (d) 0.1 (e) 0.5.

23. The time constant of a thermocouple is
(a) the time taken to attain the final temperature to be measured
(b) the time taken to attain 50% of the value of initial temperature difference
(c) the time taken to attain 63.2% of the value of initial temperature difference
(d) determined by the time taken to reach 100°C from 0°C
(e) none of the above.

24. Thermal conductivity of air with rise in temperature
(a) increases (b) decreases (c) remains constant (d) may increase or decrease depending on temperature (e) none of the above.

25. Heat flows from one body to other when they have
(a) different heat contents (b) different specific heat (c) different atomic structure
(d) different temperatures (e) none of the above.

26. The concept of overall coefficient of heat transfer is used in heat transfer problems of
(a) conduction (b) convection (c) radiation (d) all the three combined
(e) conduction and comte_ction

27. In heat transfer, conductance equals conductivity (kcal/hr/sqm/°C/cm) divided by
(a) hr (time) (b) sqm (area) (c) °C (temperature) (d) cm (thickness) (e) kcal (heat).

28. The amount of heat flow through a body by conduction is
(a) directly proportional to the surface area of the body (b) directly proportional to the temperature difference on the two faces of the body (c) dependent upon the material of the body
(d) inversely proportional to the thickness of the body (e) all of the above.

29. Which of the following has least value of conductivity
(a) glass (b) water (c) plastic (d) rubber (e) air.

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30. Which of the following is expected to have highest thermal conductivity
(a) steam (b) solid ice (c) melting ice (d) water (e) boiling water

31. Thermal conductivity of glass-wool varies from sample to sample because of variation in
(a) composition (b) density (c) porosity (d) structure (e) all of the above.

32. Thermal conductivity of a material may be defined as the
(a) quantity of heat flowing in one second through one cm cube of material when opposite faces are maintained at a temperature difference of 1°C
(b) quantity of heat flowing in one second through a slab of the material of area one cm square, thickness 1 cm when its faces differ in temperature by 1°C
(c) heat conducted in unit time across unit area through unit thickness when a temperature difference of unity is maintained between opposite faces
(d) all of the above
(e) none of the above.

33. Which of the following has maximum value of thermal conductivity
(a) aluminium (b) steel (c) brass (d) copper (e) lead.

34. Moisture would find its way into insulation by vapour pressure unless it is prevented by
(a) high thickness of insulation (b) high vapour pressure (c) less thermal conductivity insulator
(d) a vapour seal (e) all of the above.

35. Heat is transferred by all three modes of transfer, viz, conduction, convection and radiation in
(a) electric heater (b) steam condenser (c) melting of ice (d) refrigerator condenser coils
(e) boiler.

36. According to Prevost theory of heat exchange
(a) it is impossible to transfer heat from low temperature source to t high temperature source
(b) heat transfer by radiation requires no medium
(c) all bodies above absolute zero emit radiation
(d) heat transfer in most of the cases takes place by combination of conduction, convection and radiation
(e) rate of heat transfer depends on thermal conductivity and temperature difference.

37. The ratio of heat flow Q1/Q2 from two walls of same thickness having their thermal conductivities as ATj – 2K2 will be
(a) I (b) 0.5 (c) 2 (d) 0.25 (e) 4.

38. Heat transfer by radiation mainly depends upon
(a) its temperature (b) nature of the body (c) kind and extent of its surface
(d) all of the above (e) none of the above.

39, Thermal diffusivity is
(a) a dimensionless parameter (b) function of temperature (c) used as mathematical model (d) a physical property of the material (e) useful in case of heat transfer by radiation.

40. Thermal diffusivity of a substance is .
(a) proportional of thermal conductivity (b) inversely proportional to k
(c) proportional to (kf (d) inversely proportional to k2 (e) none of the above.

41. Thermal conductivity of wood depends on
(a) moisture (b) density (c) temperature (d) all of the above (e) none of the above.

42. In convection heat transfer from hot flue gases to water tube, even though flow may be turbulent, a laminar flow region (boundary layer of film) exists close to the tube. The heat transfer through this film takes place by
(a) convection (b) radiation (c) conduction (d) both convection and conduction (e) none of the above.

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43. Film coefficient is defined as Inside diameter of tube
(a) Equivalent thickness of film
(b) Thermal conductivity Equivalent thickness of film Specific heat x Viscosity
(c) Thermal conductivity Molecular diffusivity of momentum Thermal diffusivity
(d) Film coefficient x Inside diameter Thermal conductivity
(e) none of the above.

44. Heat conducted through unit area and unit thick face per unit time when temperature difference between opposite faces is unity,is called
(a) thermal resistance (b) thermal coefficient (c) temperature gradient
(d) thermal conductivity (e) heat-transfer.

45. The rate of energy emission from unit surface area through unit solid angle, along a normal to the surface, is known as
(a) emissivity (b) transmissive (c) reflectivity (d) intensity of radiation (e) absorptivity

46. Emissivity of a white polished body in comparison to a black body is
(a) higher (b) lower (c) same (d) depends upon the shape of body (e) none of the above.

47. A grey body is one whose absorptivity
(a) varies with temperature (b) varies with wavelength of the incident ray
c) is equal to its emissivity (d) does not vary with temperature and. wavelength of the incident ray (e) none of the above.

48. Two balls of same material and finish have their diameters in the ratio of 2 : 1 and both are heated to same temperature and allowed to cool by radiation. Rate of cooling by big ball as compared to smaller one will be in the ratio of
(a) 1 :1 (b) 2: 1 (c) 1 : 2 (d) 4 : 1 (e) 1 : 4.

49 The energy of an isolated system
a. is always decreasing b. is always constant c. is always increasing d. none of the above

50 The term which can differentiate thermodynamics from other sciences is ____.
a. Pressure b. Temperature c. Mass d. none of the above

गणित प्रश्न पत्र **खण्ड –2** **(1 x 10 = 10)**

1. For some integer m, every odd integer is of the form
(A) m (B) m + 1 (C) 2m (D) 2m + 1

2. The solution of y/5 = 10 is:
A. 15 B. 10 C. 50 D. 5

3.The product of a non-zero number and an irrational number is:
(A) always irrational (B) always rational (C) rational or irrational (D) one

4. An integer can be:
A. Only Positive B. Only Negative C. Both positive and negative D. None of the above

5. A rational number can be represented in the form of:
A. p/q B. pq C. p+q D. p-q

6. The value of ½ x ⅗ is equal to:
A. ½ B. 3/10 C. ⅗ D. ⅖

7.The value of ½ + ¼ is equal to:
A. ¾ B. 3/2 C. ⅔ D. 1

8. The value of (5/4) – (8/3) is:
A. 17/12 B. -17/12 C. 12/17 D. -12/17

9.The value of (-10/3) x (-15/2) x (17/19) x 0 is:
A. 0 B. 22.66 C. 20 D. 35

10. The solution of 2x-3=7 is:
A. 5 B. 7 C. 12 D. 11

English Paper **Section –3** **(1 x 10 = 10)**

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1. He got too tired _____ over work.
A) because of B) because off C) on D) for

2. Building has been built _____ the new plan.
A) accordance to B) in accordance with C) for D) about

3. He crossed the broken bridge ____ warning.
A) in spite of B) in spite off C) on D) about

4. The train ____ as fast as the bus.
A) went B) running C) moves D) going

5. She ____ in the sun for 1 hour.
A) sitting B) has been sitting C) has been sit D) has sit

6. ____ it help you in your studies?
A) will B) was C) is D) are

7. Correct the sentence if necessary. She is senior than me.
A) She is senior than me. B) She is senior to me. C) She is senior then me. D) None of the above

8. Correct the sentence if necessary. He is junior than me.
A) He is junior than me. B) He is junior then me. C) He is junior to me.
D) None of the above

9. Correct the sentence if necessary. He is senior to her.
A) He is senior than her. B) He is senior then her. C) He is senior to her.
D) None of the above

10. This is preferable than that.
A) This is preferable than that. B) This is preferable then that.
C) This is preferable to that. D) None of the above

हिन्दी प्रश्न पत्र खण्ड –4 **(1 x 15 = 15)**

1. स्वर संधि के कितने भेद है -
क – 5 ख . 4 ग. 3 घ. 6

2. देवासुर में कौनसा समास हैं -
क. बहुब्रीह ख कर्मधारय ग द्वन्द घ तत्पुरूष

3. अंतरंग का विलोम शब्द है-
क बहिरंग ख . बाहर ग अन्दर घ . अतरंगी

4. कीर्ति का पर्यायवाची है–
क यश ख अपयश ग कीर्तिवान घ बहादुर

5.हिन्दी में कारक चिन्ह कितने होते है
A- 6 B- 8 C- 7 D- 9

6. काम का तत्सम है
A- कार्यवाही B- कार्य C- कर्म D- क्रिया

7. तेली का बैल होना का अर्थ है –
A- काम में बाधा डालना B- बुरी तरह काम में लगे रहना C- कार्य अतिशीघ्र करना D-बहाना बनाना

8. तरनि तनूजा तट तमाल तरुवर छाए में कौन सा अलंकार अहि ?
A- यमक B- उत्प्रेक्षा C- अनुप्रास D- श्लेष

9.पंच परमेश्वर कहानी के लेखक है
A-रामधारी सिंह दिनकर B- प्रेमचन्द्र C- महावीर प्रसाद D- कबीर दास

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10. पावक का पर्यायवाची शब्द है-

A- पाना B- हुताशन C- पावती D- हुनर

रिक्त स्थानों को भरें।

11–ऑख.....(क) पलक (ख) नयन (ग) मस्तक (घ) कान

12–हवा..... (क) पवन (ख) अग्नि (ग) आकाश (घ)पाताल

13–कपड़ा..... (क) पवन (ख) वस्त्र (ग) पंकज (घ)पाताल

14–पत्नी.....(क)भार्या (ख) पुत्री (ग) पति (घ) अम्बर

15–पुत्र..... .(क)भाई (ख) बेटा (ग) सरोवर (घ) नदी

सामान्य ज्ञान प्रश्न पत्र **खण्ड –5** **(1 x 15 = 15)**

1–मनीपुर की राजधानी है।

(क) ईटानगर (ख) इम्फाल (ग) शिलांग (घ) मेघालय

2–महात्मा गांधी का जन्म हुआ था।

(क) 2 अक्टूबर 1859 (ख) 2 अक्टूबर 1869 (ग) 2 अक्टूबर 1879 (घ) 2 अक्टूबर 1889

3–महलो का शहर है।

(क) मुम्बई (ख) हैदराबाद (ग) कोलकाता (घ) चेन्नई

4–अभियंता दिवस किस महानपुरूष के जन्म दिवस पर मनाया जाता है।

(क) ए पी जे अब्दुल कलाम (ख) मोक्षगुडम विश्वेसरैया (ग) सरदार बल्लभ भाई पटेल (घ) सर्वपल्ली राधाकृष्णन

5–आई पी एल–2020 किस टीम ने जीता।

(क) चेन्नई सुपर किंग (ख) मुम्बई इंडियन्स (ग) आर सी बी (घ) कोलकाता नाइटराइडर

खाली स्थानों को भरें।

6–भगवान राम, राजा..... के पुत्र थे।

7–राम ने रावण का.....किया था।

8–लीप वर्ष में.....दिन होते हैं।

9–मई के बाद.....महीना आता है।

10–सप्ताह में.....दिन होते हैं।

TRANSLATEकरें।

11. SOUTH- (क) पूरब (ख) पश्चिम (ग) उत्तर (घ)दक्षिण

12.WHEAT- (क) दाल (ख) चावल (ग) गेहूँ (घ) चना

13.TEMPLE- (क) मस्जिद (ख) गुफा (ग) चर्च (घ) मंदिर

14.GRADUATION- (क) हाईस्कूल (ख) स्नातक (ग) स्नातकोत्तर (घ) इंटरमीडिएट

15.NECK- (क) हाथ (ख) केहुनी (ग) गर्दन (घ) रीढ़

.....समाप्त.....

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