



Kerala Public Enterprises (Selection and Recruitment) Board

Opposite KELTRON, Vellayambalam, Thiruvananthapuram

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Version: D

Question Booklet No: 02020

Name of Examination: Junior Operator Trainee

Date: 26/07/2026

Written examination for:

(1) Junior Operator Trainee, Kerala Minerals and Metals Limited -TP Unit

Instructions to Candidates:

1. Candidate should not start writing answers until indication is given to start answering.
2. The question paper contains 100 questions. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the Bubble corresponding to the question number using Blue or Black ball point pen in the OMR Sheet.
3. Each correct answer carries 1 mark. There will be no negative mark for wrong answers or unattended questions.
4. Do not write anything else on the question paper. Space for rough work is provided at the end.
5. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the 'Basic Data' portion and that the Invigilator has affixed his/her signature in the space provided in the OMR sheet.

Total number of questions: 100 Maximum marks: 100 Time: 90 Minutes

1	Phosphatic fertiliser is graded based on			
	(A)	PCl_5 Content	(B)	H_3PO_4 Content
	(C)	P_2O_5 Content	(D)	P_2O_3 Content
2	Which strategy most directly applies a core green chemistry principle			
	(A)	Use of supercritical CO_2	(B)	Burning used solvents
	(C)	Storing solvents in sealed containers	(D)	Installing larger fume hoods
3	Cylinder dryers are used in			

	(A) Dairy industry	(B) Pharmaceutical industry
	(C) Paper industry	(D) Detergent industry
4	Which is the most stable conformation for 2-Fluoroethanol?	
	(A) Chair	(B) Eclipsed
	(C) Anti	(D) Gauche
5	Identify the naturally occurring organometallic compound from the following	
	(A) Chlorophyll	(B) Myoglobin
	(C) Haemoglobin	(D) Vitamin B ₁₂
6	Identify the instrument that can be used to measure very low pressure	
	(A) Diaphragm Gauge	(B) C-Type Bourdon tube
	(C) Bellows gauge	(D) McLeod gauge
7	The third law of thermodynamics deals with	
	(A) Quantitative equivalence between heat and work	(B) Chemical reaction
	(C) Rate of change of process	(D) Absolute entropy of perfect crystalline substances
8	To produce ammonia, 100 kmol of nitrogen and 300 kmol of hydrogen are fed to a reactor	
	(A) The reactants are fed in stoichiometric proportions	(B) Hydrogen is fed in excess
	(C) None of these	(D) Nitrogen is fed in excess
9	Bernoulli's equation accounts for the	
	(A) None of these	(B) Different forms of mechanical energy
	(C) Various momentums	(D) Various masses
10	The pre exponential term in the Arrhenius equation depends on	

	(A) None of these	(B) Temperature and concentration
	(C) temperature	(D) Concentration
11	What is the order of reaction which has a rate expression, $\text{rate} = k[A]^{3/2} [B]^{-1}$	
	(A) None of these	(B) $3/2$
	(C) Zero	(D) $1/2$
12	Isocyanides can be prepared by heating a mixture of alkyl iodide and	
	(A) Hydrogen cyanide	(B) Sodium cyanide
	(C) Silver cyanide	(D) Potassium cyanide
13	Basicity of boric acid is	
	(A) 2	(B) 1
	(C) 3	(D) 4
14	What is the product formed when 1-methylcyclohexane is reacted with HBr	
	(A) 1-Bromo-3-methylcyclohexane	(B) 1-Bromo-1-methylcyclohexane
	(C) None of these	(D) 1-Bromo-2-methylcyclohexane
15	Identify the major product from the reaction of $\text{CH}_3\text{CH}_2\text{ONa}$ with $(\text{CH}_3)_3\text{CCl}$ in ethanol	
	(A) $\text{CH}_2=\text{C}(\text{CH}_3)_2$	(B) $\text{CH}_3\text{CH}_2\text{C}(\text{CH}_3)_3$
	(C) $\text{CH}_3\text{CH}_2\text{OC}(\text{CH}_3)_3$	(D) $\text{CH}_3\text{CH}=\text{CHCH}_3$
16	Insufficient liquid delivery by a centrifugal pump may be caused by	
	(A) High suction lift	(B) Air leaks in suction piping
	(C) All of these	(D) Clogged suction strainer
17	Transfer of heat by molecular collision is called	
	(A) Convection	(B) Radiation
	(C) Conduction	(D) All of these
18	Poise is the unit of	

	(A) Kinematic viscosity	(B) Dynamic viscosity
	(C) Velocity gradient	(D) Density
19	Which of the following has highest pKa value	
	(A) Bromo acetic acid	(B) Chloroacetic acid
	(C) Acetic acid	(D) Formic acid
20	The proximate analysis of coal gives.	
	(A) Carbon, hydrogen, sulphur and nitrogen	(B) Carbon, hydrogen and ash
	(C) Volatile matter, moisture, ash and fixed carbon	(D) Volatile matter, moisture, nitrogen and carbon
21	Find the kilograms of carbon present in 32 kg of methane	
	(A) 32 kg	(B) 28 kg
	(C) 12 kg	(D) 24 kg
22	In excited hydrogen atom when electron drops from $n=4,5,6$ to $n=1$, there is emission of	
	(A) UV-light	(B) X-rays
	(C) IR-light	(D) visible light
23	The formation of a carbocation is characteristic of	
	(A) SN^2 reaction	(B) $SNAr$ reaction
	(C) SN^1 reaction	(D) Benzyne mechanism
24	Which petroleum fraction has the maximum H/C ratio	
	(A) Diesel	(B) Gasoline
	(C) Naptha	(D) Kerosene
25	The rate of reaction generally increases rapidly even for small temperature increase because of a rapid increase in	

	(A) Collision frequency	(B) Average kinetic energy of the molecule	
	(C) Fraction of molecules with energies in excess of activation energy	(D) Activation Energy	
26	A plug flow reactor is characterised by		
	(A) Back mixing	(B) Complete mixing	
	(C) No radial mixing	(D) No axial mixing	
27	Among the following gases which is called 'Stranger Gas'?		
	(A) Methane	(B) Xenon	
	(C) Helium	(D) Nitric oxide	
28	The key difference between a DN100 Schedule 40 and a DN100 Schedule 60 pipe is		
	(A) Same OD, Same thickness	(B) Same OD, thicker wall for Sch 60	
	(C) Same ID, thicker wall for Sch 60	(D) Different OD	
29	Which one of the following is a non-reducing sugar?		
	(A) Lactose	(B) Glucose	
	(C) Maltose	(D) Sucrose	
30	Bourdon spring may be of the type of		
	(A) Spiral	(B) C	
	(C) Helical	(D) All of these	
31	Octane number of gasoline is a measure of its		
	(A) Knocking tendency	(B) Smoke point	
	(C) Ignition temperature	(D) Ignition delay	
32	Which of the following process in the oil refinery does not employ cracking		
	(A) Pyrolysis	(B) None of these	
	(C) Vis breaking	(D) Coking	

33	Identify the least stable ion among the following			
	(A)	B^-	(B)	C^-
	(C)	Be^-	(D)	Li^-
34	Identify the correct statement			
	(A)	An open system does not have any boundaries	(B)	An open system exchanges both energy and matter with its surroundings
	(C)	An open system does not exchange energy with its surroundings	(D)	An open system exchanges energy but not matter with its surroundings
35	Identify the fire extinguisher generally preferred for a Class D fire			
	(A)	Dry powder for metals	(B)	Water
	(C)	CO_2	(D)	Foam
36	The GCV of a fuel can be estimated using			
	(A)	Bomb calorimeter	(B)	Saybolt viscometer
	(C)	Redwood viscometer	(D)	Orsat apparatus
37	HLB number is related to			
	(A)	Electrical double layer	(B)	Emulsifier
	(C)	Stability of colloids	(D)	Zeta potential
38	The catalyst used in the DCDA process for the manufacture of sulphuric acid is			
	(A)	V_2O_5	(B)	Ni
	(C)	Mo	(D)	$Fe+Al_2O_3/K_2O$
39	What could be the enthalpy for a system where the internal energy = 500 kJ, Pressure = 2 bar, and Volume = $0.5m^3$			
	(A)	501KJ	(B)	500KJ
	(C)	600KJ	(D)	700KJ

40	The operating parameters of a cooling tower are water inlet at 40 °C, water outlet at 32°C, dry bulb temperature of 35°C, and wet bulb temperature of 27°C. The approach of the cooling tower is			
	(A)	13°C	(B)	5°C
	(C)	8°C	(D)	3°C
41	If a solid-gas non catalytic reaction occurs at very high temperature, the rate controlling step is			
	(A)	Ash layer diffusion	(B)	Film diffusion
	(C)	None of these	(D)	Pore diffusion
42	Which type of cooling tower is most favoured in the chemical process industries			
	(A)	Forced draft	(B)	Spray tower without fill
	(C)	Induced draft	(D)	Hyperbolic tower
43	Choose the wrong statement regarding surface catalysed reaction			
	(A)	It accelerates the rate of attainment of equilibrium	(B)	It increases the rate of forward reaction only
	(C)	It decreases the activation energy	(D)	It does not change the thermodynamic parameters of the reaction
44	Safety valve is basically a			
	(A)	None of these	(B)	Check valve
	(C)	Globe valve	(D)	Gate valve
45	The existence of two different coloured complexes of $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]$ is due to			
	(A)	geometrical isomerism	(B)	coordination isomerism
	(C)	linkage isomerism	(D)	optical isomerism
46	Which of the following is not an electrokinetic phenomenon			
	(A)	Electro osmosis	(B)	Donnan membrane equilibrium
	(C)	Electrophoresis	(D)	Streaming potential

47	The metal used in Sandmeyer reaction is			
	(A)	Ag(I)	(B)	Cu(II)
	(C)	Cu(I)	(D)	Hg(II)
48	Electrical conductivity of a semiconductorwith temperature			
	(A)	independent of	(B)	increase
	(C)	initially increases then decreases	(D)	Decrease
49	The best quality of steam for indirect heating in industrial process is			
	(A)	Wet	(B)	High pressure
	(C)	Superheated	(D)	Dry saturated
50	Fermentation of molasses to produce ethyl alcohol is done at			
	(A)	40-60°C	(B)	20-30°C
	(C)	250-300°C	(D)	100-150°C
51	Which of the following is not a model of electrical double layer			
	(A)	Stern Volmer	(B)	Gibbs Helmholtz
	(C)	Stern	(D)	Gouy Chapman
52	3 moles of NH_3 contains			
	(A)	None of these	(B)	42 g of nitrogen
	(C)	Both a) and b)	(D)	18 g of hydrogen
53	Which reaction involves an ylide intermediate in the mechanism			
	(A)	Witting	(B)	Gattermann-Koch
	(C)	Wagner-Meerwein	(D)	HVZ
54	When you perform Fehling's test, which among the following will give a positive result			
	(A)	Proteins	(B)	Sucrose
	(C)	Glucose	(D)	Lipids

55	Which of the following nuclei are not NMR active			
	(A)	^{19}F	(B)	^{14}N
	(C)	^{16}O	(D)	^{23}Na
56	Liquefied Petroleum Gas is mainly a mixture of			
	(A)	Methane and ethane	(B)	Propane and butane
	(C)	High boiling olefins	(D)	High boiling naphthenes
57	Reynolds Number is the ratio of			
	(A)	Viscous force to inertial force	(B)	Inertial force to viscous forces
	(C)	Viscous force to gravity forces	(D)	Inertial force to gravity force
58	Which among the following is the most acidic			
	(A)	Choloroacetic acid	(B)	Acetic acid
	(C)	Propionic acid	(D)	Nitroacetic acid
59	SO_2Cl_2 dissociates to SO_2 and Cl_2 with a $K_p = 2.9 \times 10^{-2}$. The degree of dissociation at a total pressure of 1 atm is:			
	(A)	0.29	(B)	0.50
	(C)	0.22	(D)	0.17
60	From the methods given below, identify the method that converts biodegradable waste to a biofertilizer			
	(A)	Landfilling	(B)	Aerobic composting
	(C)	Incineration	(D)	Pyrolysis
61	A catalytic fluidized bed reactor is characterized by			
	(A)	High presssure drop	(B)	Uniform temperature
	(C)	Fixed catalyst bed	(D)	Poor mixing
62	The structure of Zeise's is			

	(A) tetrahedral	(B) trigonal bipyramidal
	(C) Octahedral	(D) square planar
63	Identify the secondary air pollutant	
	(A) Sulfur dioxide	(B) Particulate matter
	(C) Carbon monoxide	(D) Photochemical smog
64	The Air (Prevention and control of pollution) Act was enacted in the year	
	(A) 1981	(B) 1996
	(C) 1974	(D) 2000
65	Entropy change of a system is zero in	
	(A) Reversible adiabatic process	(B) Isothermal process
	(C) Reversible process	(D) Adiabatic process
66	The cleansing action of soap is due to the formation of	
	(A) Micelles	(B) Zwitterions
	(C) Crystals	(D) Chelates
67	The number of absorptions in IR spectrum of CO_2 is	
	(A) 6	(B) 2
	(C) 3	(D) 4
68	Crystal symmetry is expressed conveniently using	
	(A) Miller indices	(B) Schoenflies symbol
	(C) Braggs equation	(D) Hermann Mauguin symbol
69	A solution which resists change in its pH value on addition of small amounts of acid or alkali is classified as	
	(A) Standard solution	(B) Saturated solution
	(C) Buffer solution	(D) Neutral solution
70	Which thermodynamic property is constant during an "Isentropic" process?	

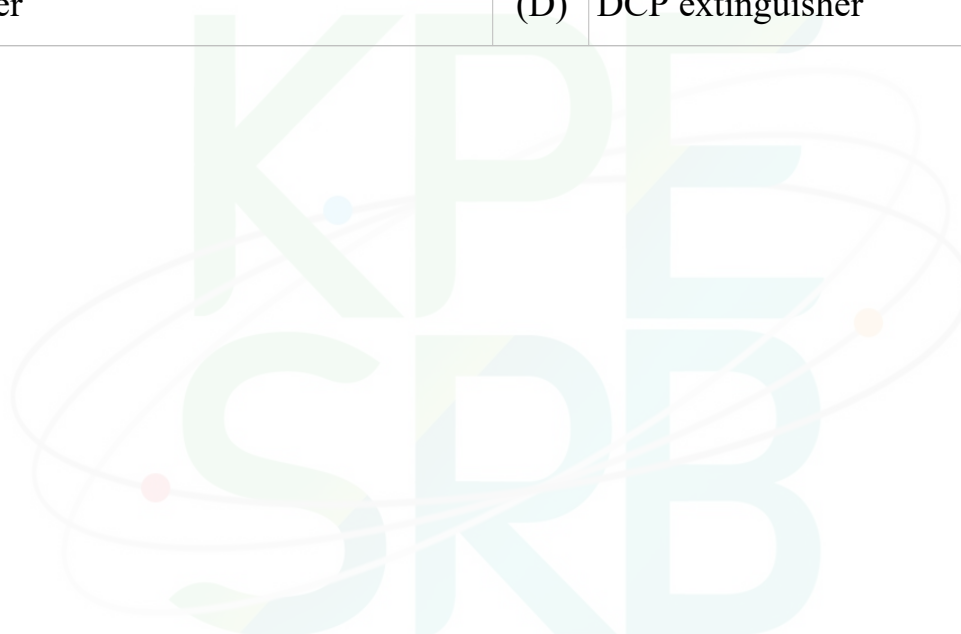
	(A) Internal Energy	(B) Temperature
	(C) Enthalpy	(D) Entropy
71	Water and Water vapour taken in a closed container is a	
	(A) Isothermal system	(B) Heterogeneous system
	(C) Isolated system	(D) Homogeneous system
72	The lanthanide which exhibits radioactivity is	
	(A) Pm	(B) Sm
	(C) La	(D) Gd
73	Radioactive solid nuclear wastes are disposed off by	
	(A) High temperature incineration	(B) Underground burial in concrete containers
	(C) Pyrolysis	(D) Pathological incineration
74	The ratio of momentum diffusivity to thermal diffusivity is called	
	(A) Prandtl number	(B) Reynolds number
	(C) Grashof number	(D) Nusselt number
75	If BOD of river water is high, then it implies that the river is	
	(A) Not at all polluted	(B) Highly polluted with inorganic chemicals
	(C) Highly polluted with biodegradable organic chemicals	(D) Polluted with pesticides
76	The unit of diffusion coefficient is	
	(A) m^2/s	(B) $\text{mole}/\text{m}^2\text{s}$
	(C) none of these	(D) m/s
77	Which of the following is not a differential pressure flow meter	

	(A) Venturimeter	(B) Rotameter
	(C) Orificemeter	(D) Flow nozzle
78	The Nitrogen content of urea	
	(A) 26% N by weight	(B) None of these
	(C) 46% N by weight	(D) 56 % N by Weight
79	The Double Contact Double Absorption process is the most recent process for the manufacture of	
	(A) Hydrochloric acid	(B) Sulphuric acid
	(C) Ammonium sulphate	(D) Nitric acid
80	The reaction by which Indole is converted into 3-dimethylamino-methylindole (Gramin) by is	
	(A) Reimer-Tiemann reaction	(B) Reissert synthesis
	(C) Mannich reaction	(D) Friedlander's synthesis
81	One mole of benzene is mixed with one mole of toluene at 300 K. The Gibbs free energy of mixing assuming ideal solution is approximately	
	(A) -1.8 KJ	(B) 1.8 kJ
	(C) 6J	(D) 0
82	In a common effluent treatment plant (CETP) the function of the equalisation tank is to	
	(A) Produce biogas	(B) Kill pathogens
	(C) Stabilise wastewater flow and concentration	(D) Recover heat
83	The metal used in Reformatsky reaction is	
	(A) Zn	(B) Mg
	(C) Hg	(D) Sn
84	The following type of bonding is strongly directional in solids	

	(A) Van der Waals bonding	(B) Metallic bonding
	(C) Covalent bonding	(D) Ionic bonding
85	How many moles are there in 500g of oxygen	
	(A) 9.41×10^{24}	(B) 15.625
	(C) 22.4×10^3	(D) 31.25
86	For the reaction $2\text{NO} + \text{O}_2 \rightarrow 2\text{NO}_2$, the rate of the reaction is expressed as $k[\text{NO}]^2[\text{O}_2]$. Identify the order of the reaction.	
	(A) 1	(B) 3
	(C) 0	(D) 2
87	Energy in Einstein associated with radiation of wavelength 400nm is approximately	
	(A) 300kJ	(B) 100kJ
	(C) 200kJ	(D) 400kJ
88	Identification of pipeline carrying different liquids and gases is done by _____ of the pipe	
	(A) None of these	(B) Diameter
	(C) Altitude	(D) Colour
89	Ratio of emissive power of a body to the emissive power of a perfectly black body, is called	
	(A) Emissivity	(B) Absorptivity
	(C) Transmissivity	(D) Reflectivity
90	Vapour pressure of benzene and toluene at 600°C are 385 and 139 Torr respectively. The mole fraction of toluene in the vapour for a binary solution with 0.6 mole fraction toluene is	
	(A) 0.6	(B) 0.65
	(C) 0.4	(D) 0.35
91	Among the followong, which is not isoelectronic?	

	(A) N_2	(B) O_2^{2+}
	(C) CN^-	(D) NO^-
92	For an adiabatic process	
	(A) None of these	(B) Heat flows from the surroundings to the system
	(C) No heat interaction between the system and surroundings	(D) Heat flows from the system to the surroundings
93	The ratio of the quantity of the desired product actually produced to its maximally obtainable quantity is known as	
	(A) Stoichiometric ratio	(B) Yield
	(C) Conversion	(D) Selectivity
94	Which three elements constitute the “Fire Triangle”	
	(A) Fuel, CO_2 , Ignition	(B) Fuel, Nitrogen, Heat
	(C) Carbon, Oxygen, Spark	(D) Fuel, Oxygen, Heat
95	If uncertainty in the position of an electron is zero, the uncertainty in its velocity would be	
	(A) infinity	(B) $h/4\pi$
	(C) $ch/2\pi$	(D) Zero
96	What does 3 indicate in the Hazchem code 3 YE	
	(A) Use water spray	(B) Use foam
	(C) Use CO_2	(D) Use dry powder
97	For a given principle level $n=4$, the energy of its sub shells is of the order	
	(A) $s < p < d < f$	(B) $d < f < p < s$
	(C) $s < p < f < d$	(D) $s < d < f < p$
98	Which of the following species is paramagnetic?	

	(A) O_2	(B) H_2	
	(C) N_2	(D) O_2^{2-}	
99	In a mercury manometer measuring the pressure of water in a pipe, the manometric rise is 0.2m. The specific gravity of mercury is 13.55. The water pressure in m of water is		
	(A) 14.55×0.2	(B) 12.55×0.2	
	(C) 13.55×0.2	(D) 1.0×0.2	
100	The fire extinguisher ideal for electrical fires		
	(A) Foam extinguisher	(B) CO_2 extinguisher	
	(C) Water	(D) DCP extinguisher	



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