PROVISIONAL ANSWER KEY

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Question1:-Let A, B and X be three matrices such that A = BX. If A=$\begin{bmatrix}1 & 2\\4 & -6\end{bmatrix}$ and B= $\begin{bmatrix}1 & 0\\0 & 2\end{bmatrix}$, then X equals

A:-$\begin{bmatrix}1 & 2\\2 & -3\end{bmatrix}$

B:-$\frac{1}{2}\begin{bmatrix}1 & 2\\2 & -3\end{bmatrix}$

C:-$\frac{1}{2}\begin{bmatrix}1 & 0\\0 & 2\end{bmatrix}$

D:-$\begin{bmatrix}1 & 4\\-1 & 1\end{bmatrix}$

Correct Answer:- Option-A

Question2:-If a+b+c=0, one root of $\begin{vmatrix}a-x & c & b\\c & b-x & a\\b & a & c-x\end{vmatrix}=0$ is

A:-$a^2+b^2+c^2$

B:-1

C:-2

D:-0

Correct Answer:- Option-D

Question3:-The term independent of x in the expansion of $\left(2x-\frac{1}{x}\right)^{10}$ is

A:-4th

B:-5th

C:-6th

D:-10th

Correct Answer:- Option-C

Question4:-The equation of the line that had y intercept 4 and is perpendicular to 3x+2y=7 is

A:-2x-3y-12=0

B:-2x-3y+12=0

C:-2x+3y+12=0

D:-2x+3y-12=0

Correct Answer:- Option-B

Question5:-If $\tan x=\frac{b}{a}$, then the value of acos2x+2sin2x is

A:-a+b

B:-a-b

C:-a

D:-b

Correct Answer:- Option-C

Question6:-$\int \frac{x}{x^4+x^2+1}dx$ is equal to

A:-$\sin^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)+c$

B:-$\frac{1}{\sqrt{3}}\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)+c$

C:-$\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)+c$

D:-$\frac{1}{3}\tan^{-1}\left(\frac{2x^2+1}{\sqrt{3}}\right)+c$

Correct Answer:- Option-B

Question7:-If $y=4x-5$ is a tangent to the curve $y^2=px^3+q$ at (2,3), then (p,q)=

A:-(2,7)

B:-(-2,7)

C:-(7,2)

D:-(2,-7)

Correct Answer:- Option-D

Question8:-For the function $f(x)=xe^x$, the point

A:-x=-1 is a point of minimum

B:-x=-1 is a point of maximum

C:-x=0 is a point of minimum

D:-x=0 is a point of maximum

Correct Answer:- Option-A

Question9:-The area of the region bounded by the curve $y=1-|x|$ and x-axis is

A:-1/2

B:-3/2

C:-1

D:-2

Correct Answer:- Option-C

Question10:-The solution of the differential equation $\frac{dy}{dx}+2y=e^{-2x}$ is

A:-$ye^{2x}=x+c$

B:-$ye^{x}=x+c$

C:-$ye^{2x}=xy+c$

D:-$ye^{-2x}=x+c$

Correct Answer:- Option-A

Question11:-Two rubbers which are prepared by coordination polymerization are

A:-BR and SBR

B:-BR and CR

C:-BR and IIR

D:-IR and EPDM

Correct Answer:- Option-D

Question12:-The following is not a delayed action accelerator

A:-MBTS

B:-CBS

C:-NOBS

D:-DPG

Correct Answer:- Option-D

Question13:-A very convenient cure system for poly acrylate rubber is

A:-Peroxide

B:-Isocyanate

C:-Sulphur + MBTS

D:-Sulphur+soap

Correct Answer:- Option-D

Question14:-Banbury mixing is suitable for industries doing

A:-Large volumes of limited number of compounds based on similar rubbers

B:-Small volumes of a large number of compounds

C:-Any type of rubber industry

D:-Large volumes of large number of compounds involving all types of rubbers

Correct Answer:- Option-A

Question15:-Natural rubber is

A:-Highly suitable for injection moulding

B:-Difficult to injection mould due to compounds with high viscosity and high scorch danger

C:-Difficult to injection mould due to scorch danger

D:-Difficult to injection mould due to high viscosity compounds

Correct Answer:- Option-B

Question16:-Reclaimed rubber is useful because

A:-It helps to reduce cost

B:-Ir reduces cost and gives processing advantages

C:-It reduces cost, gives processing advantages and also improves ageing resistance for NR compounds besides solving pollution problem caused by littering of used tyres

D:-It reduces cost, gives processing advantages besides reducing pollution

problem caused by littering of used tyres

Correct Answer:- Option-C

Question17:-_____ polymer is suitable for blow moulding

A:-NR

B:-EPDM

C:-Silicone

D:-SBS

Correct Answer:- Option-D

Question18:-The life of an oil seal depends on _____ property

A:-Compressive modulus

B:-Creep modulus

C:-Compression set

D:-Hardness

Correct Answer:- Option-C

Question19:-For getting the faster cure rate in IIR

A:-we can increase isoprene content

B:-we can halogenate it

C:-both of the above

D:-neither 1 or 2

Correct Answer:- Option-C

Question20:-CR is modified during polymerization to

A:-Reduce its crystallization

B:-Increase cure rate

C:-Increase storage stability

D:-Improve its ageing resistance

Correct Answer:- Option-A

Question21:-The difficult in dispersing silica in diene rubbers is due to

A:-participate-particle interactions in the filler

B:-Hydrophobicity of the filer

C:-Moisture content in the filler

D:-Rubber-rubber interactions

Correct Answer:- Option-A

Question22:-Payne effect is studied using

A:-Dynamic mechanical analysis

B:-SEM

C:-DSC

D:-Mooney viscometer

Correct Answer:- Option-A

Question23:-The first generation of solution SBR had

A:-Blockiness

B:-Gel content

C:-Crystallinity

D:-Ionic cross linking

Correct Answer:- Option-A

Question24:-A non polar rubber which can surpass NR in all aspects is

A:-Poly norbornene

B:-BR

C:-Poly dimethyl butadiene

D:-Poly alkenamer

Correct Answer:- Option-D

Question25:-Upside down mixing is done for

A:-Natural rubber

B:-SBR

C:-BR

D:-Rubbers which soften quickly during mixing

Correct Answer:- Option-D

Question26:-For easy transport and handling, carbon black is

A:-Functionalized

B:-Pelletised

C:-Oxidized

D:-Reduced

Correct Answer:- Option-B

Question27:-ZnO+Steatic acid causes

A:-Increase in cure rate

B:-Increase in cross linking extent

C:-Scorch

D:-Decrease in cure time

Correct Answer:- Option-B

Question28:-The excellent tackiness of NR is due to

A:-Low Tg which leads to high chain mobility

B:-Strain induced crystallization

C:-Protein

D:-Both 1 and 2

Correct Answer:- Option-D

Question29:-The difficulty in dissolving cellulose in water, in spite of too many OH groups in it, is because of

A:-Entanglements between the chains

B:-Cross linking

C:-Hydrogen bonding

D:-Very high molecular weight

Correct Answer:- Option-C

Question30:-If Tg of a polymer is close to ambient temperatures but melting point is high (i.e. more than 3/2 of its Tg), it means that the polymer is

A:-a rubber

B:-amorphous plastic

C:-thermoset

D:-crystalline and fibre

Correct Answer:- Option-D

Question31:-The difficulty in getting a fluorocarbon rubber based on homopolymers is due to

A:-High polarity of the F atom

B:-High electronegativity of F atom

C:-Crystallization tendency of the resulting polymer

D:-Hydrogen bonding

Correct Answer:- Option-C

Question32:-Which rubber is prepared from another polymer?

A:-CR

B:-SBR

C:-CSM

D:-ACM

Correct Answer:- Option-C

Question33:-A polymer which cannot be cross linked is

A:-PE

B:-Poly isobutylene

C:-IIR

D:-EPM

Correct Answer:- Option-B

Question34:-Chlorination of Natural rubber involves

A:-Free radicals

B:-Anions

C:-Electrophilic addition and cyclisation

D:-Electrophilic addition only

Correct Answer:- Option-C

Question35:-When you get ethylene based rubbers, the resulting polymer gets a Tg above that of PE (assuming it to around -80C). This is because

A:-rubberiness is achieved by breaking the crystallization of PE by adding bulky side chains

B:-the resulting polymer has lesser inter chain attractions

C:-rubberiness leads to reduction in Tg

D:-the resulting polymer had more inter chain attractions than PE

Correct Answer:- Option-A

Question36:-Apart from ageing resistance, anti oxidants may improve

A:-Fatigue and abrasion resistance

B:-Tensile strength

C:-Hardness

D:-Tear resistance

Correct Answer:- Option-A

Question37:-High molecular weight in polymer chains lead to higher viscosity because of

A:-Vander Waals forces

B:-More entanglements between chains above a critical molecular weight

C:-Crystallinity

D:-Crosslinking

Correct Answer:- Option-B

Question38:-Often, high temperature polymers will also be highly rigid because

A:-They are highly cross linked

B:-They often have aromatic rings in the main chain (brydson, plastics materials p 584)

C:-They have high decomposition temperatures

D:-They have too much of interchain attractions

Correct Answer:- Option-B

Question39:-Among the following high temperature plastics _____ has some crystallizing tendency

A:-Poly sulphone

B:-PEEK

C:-Polyimide

D:-Cyanate ester resin

Correct Answer:- Option-B

Question40:-Peroxide cured EPDM compounds are not suitable for microwave curing because

A:-They are not conductive compounds

B:-The bonds (including C-C cross links) in the rubbers do not produce dipole moments during vibration

C:-They are non polar rubbers

D:-They release volatiles on curing

Correct Answer:- Option-B

Question41:-In DSC, the _____ is potted against temperature

A:-Temperature rise

B:-Thermal conductivity

C:-Thermal resistivity

D:-Heat capacity Wunderlich B (1990). Thermal Analysis New York: Academic Press pp. 137-140. ISBN 0-12-765605-7

Correct Answer:- Option-D

Question42:-High strength carbon fibre is produced from

A:-Cellulose

B:-Rayon

C:-Pitch

D:-PAN

Correct Answer:- Option-D

Question43:-High modulus fibres can be prepared by

A:-Extrusion

B:-Solution casting

C:-Solution spinning

D:-Gel spinning

Correct Answer:- Option-D

Question44:-The following method does not give molecular weight distribution

A:-GPC

B:-Fractionation

C:-Light scattering

D:-Osmometry

Correct Answer:- Option-D

Question45:-Rubber elasticity is driven by changes in

A:-Entropy

B:-Enthalpy

C:-Inter chain interactions

D:-Cross links

Correct Answer:- Option-A

Question46:-A rubber is _____ polymer

A:-Crystalline

B:-Amorphous but may crystallize on straining

C:-always crystallizes in stretching

D:-always crystallizes on cooling

Correct Answer:- Option-B

Question47:-Rubber used for IB cap

A:-Silicone Rubber

B:-Natural Rubber

C:-EPDM

D:-None of the above

Correct Answer:- Option-B

Question48:-Inorganic blowing agents release

A:-Carbon dioxide

B:-Nitrogen

C:-Carbon monoxide

D:-None of the above

Correct Answer:- Option-A

Question49:-The rubber used in tyre innreliner

A:-Natural rubber

B:-NR-SBR blends

C:-Bromo butyl Rubber

D:-NR-PBD-SBR blends

Correct Answer:- Option-C

Question50:-Metal oxide crosslinking used in

A:-Silicone rubbers

B:-Chloroprene Rubbers

C:-Natural rubber

D:-NBR

Correct Answer:- Option-B

Question51:-Flat spotting of the tyre occurs in

A:-Aramid chords

B:-Steel chords

C:-Polyester chords

D:-Nylon chords

Correct Answer:- Option-D

Question52:-Upside down mixing is associated with

A:-Natural rubber

B:-Silicone rubber

C:-EPDM

D:-NBR

Correct Answer:- Option-D

Question53:-Neutral angle for hose manufacturing

A:-54º44'

B:-52º44'

C:-44º54'

D:-54º54'

Correct Answer:- Option-A

Question54:-Conveyor belt crosslinked by

A:-Roto cure

B:-Press cure

C:-Both

D:-None of the above

Correct Answer:- Option-C

Question55:-Hildebrand is the unit of

A:-Flory interaction parameter

B:-Enthalpy

C:-Solubility parameter

D:-None of these

Correct Answer:- Option-C

Question56:-Resilience is inversely related to

A:-Heat build up

B:-Compression set

C:-Tension set

D:-All of these

Correct Answer:- Option-A

Question57:-The major metal present in sludge removed from latex is

A:-Cu

B:-Fe

C:-Mg

D:-None of these

Correct Answer:- Option-C

Question58:-What is the use of Potassium oleate in natural rubber latex foam?

A:-Activator

B:-Antioxidant

C:-Stabilizer

D:-Foam promoter

Correct Answer:- Option-D

Question59:-Which is used as an anti-coagulating agent

A:-Formalin

B:-Ammonia

C:-Sodium sulphite

D:-All of the above

Correct Answer:- Option-D

Question60:-Which type of wheels is preferred for sports cars

A:-Disc wheel

B:-Wire wheel

C:-Magnesium wheel

D:-Aluminium Alloy

Correct Answer:- Option-C

Question61:-What do the permissible of mixing cross ply and radial ply automibile tyres allow?

A:-Cross ply tyres on left wheels

B:-Cross ply tyres on right wheels

C:-Cross ply tyres on front wheels

D:-Cross ply tyres on rear wheels

Correct Answer:- Option-C

Question62:-What is GRS?

A:-Styrene-acrylonitrile copolymer

B:-Styrene butadiene rubber

C:-Acrylonitrile butadiene styrene

D:-Ethylene propylene diene monometer

Correct Answer:- Option-B

Question63:-Electrodeposition process related to which product?

A:-Tyre

B:-O ring

C:-Gloves

D:-None of the above

Correct Answer:- Option-C

Question64:-Material used in tyre-cord adhesive is

A:-Styrene-vinylpyridine-butadiene terpolymer latices

B:-Styrene-nutadiene rubber latices

C:-Acrylonitrile-butadiene latices

D:-Polychloroprene rubber latices

Correct Answer:- Option-A

Question65:-Which of the following are examples of natural fibers?
(i) Nylon
(ii) Jute
(iii) Polyester
(iv) Sisal

A:-(i) and (ii)

B:-(ii) and (iv)

C:-(i) and (iv)

D:-(ii) and (iii)

Correct Answer:- Option-B

Question66:-What is the most widely used man-made fiber?

A:-Polyester

B:-Carbon

C:-Aramid

D:-Nylon 6

Correct Answer:- Option-A

Question67:-A common matrix material used in FRP is

A:-Polystyrene

B:-Polyethylene

C:-Epoxy resin

D:-None of these

Correct Answer:- Option-C

Question68:-The dispersed phase in common fiber reinforced plastic is

A:-Glass fiber

B:-Carbon fiber

C:-Aramid fiber

D:-All of these

Correct Answer:- Option-C

Question69:-Melting point is the characteristics of

A:-Amorphous polymer

B:-Crystalline polymers

C:-Semi crystalline polymers

D:-1 and 3

Correct Answer:- Option-B

Question70:-Dibutyl phalate, Tricresyl phosphate are all example of

A:-Antioxidant

B:-Plasticizer

C:-Curing agent

D:-Stabilizer

Correct Answer:- Option-B

Question71:-Name a self-extinguishing thermoplastic material

A:-UHMWDPE

B:-PS

C:-PVC

D:-LDPE

Correct Answer:- Option-C

Question72:-Which one of the following materials is used for making CD?

A:-PET

B:-None

C:-PMMA

D:-PC

Correct Answer:- Option-D

Question73:-High temperature, high performance polymeric materials are called _____ polymers

A:-Engineering

B:-Liquid crystal

C:-Specialty

D:-Commodity

Correct Answer:- Option-C

Question74:-Which one of the following is a natural polymer?

A:-Shellac

B:-Teflon

C:-PPO

D:-PS

Correct Answer:- Option-A

Question75:-Phenol and formaldehyde molar ration for resol synthesis is _____ under basic medium

A:-1:1

B:-1:2

C:-1:1.5

D:-1:0.5

Correct Answer:- Option-C

Question76:-One of the important joining techniques used for thermoplastic and will produce a permanently bonded and aesthetically pleasing joint

A:-Threads and Threading

B:-Metal Insert

C:-Vibration and hotplate welding

D:-Ultrasonic welding

Correct Answer:- Option-D

Question77:-Which of the following could be made from HDPE

A:-Rigid drainage pipes

B:-Water Storage tank

C:-Soft drink crates

D:-All of these

Correct Answer:- Option-D

Question78:-Processing temperature of PP for below moulding

A:-130-180

B:-200-220

C:-230-250

D:-190-205

Correct Answer:- Option-B

Question79:-For pipe application PVC is manufactured by _____ polymerization

A:-Suspension polymerization

B:-Micro Suspension Polymerization

C:-Bulk polymerization

D:-Pearl polymerization

Correct Answer:- Option-A

Question80:-Natural polyol used for the production of polyurethane foam

A:-Castor oil

B:-PEG

C:-Glycerol

D:-Soybean Polyol

Correct Answer:- Option-A

Question81:-Which of the following is amino plastic?

A:-PRFE

B:-PC

C:-UF

D:-PF

Correct Answer:- Option-C

Question82:-PPO can be used in steam autoclave because of its

A:-High hydrolytic stability

B:-Goof flame extinguishing character

C:-Less thermal expansion

D:-None of these

Correct Answer:- Option-A

Question83:-A major disadvantage of mill mixing as compared to internal mixer is

A:-It is time consuming and depends upon the skill of the operator

B:-It is difficult to prevent rapid rise of stock temperature

C:-It provides no shearing action

D:-None of the above

Correct Answer:- Option-A

Question84:-From the point of view of ingredients, the following physical changes occur during a mixing cycle

A:-Entering, Contacting, flowing and dumping

B:-Incorporation, dispersion, distribution and plasticization

C:-Contacting, squeezing and moving

D:-None of the above

Correct Answer:- Option-B

Question85:-Increase in the rotor speed of an internal mixer will result in

A:-Increase in the temperature of cooling water

B:-Decrease in stock temperature

C:-Increase in the stock viscosity

D:-Decrease in the shear rate

Correct Answer:- Option-A

Question86:-To measure the stock temperature inside a Banbury mixer, the device used is

A:-A pyrometer

B:-A mercury thermometer

C:-A thermocouple

D:-A gas-thermometer

Correct Answer:- Option-C

Question87:-Crows feet is related to _____ process

A:-Extrusion

B:-Transfer molding

C:-Injection molding

D:-Calendaring

Correct Answer:- Option-D

Question88:-Frictioning in a calendar involves

A:-Coating a fabric with rubber stock at least 1/8 inch thick

B:-Depositing and cost of liquid cement on a fabric for better adhesion

C:-Forcing the rubber into the interstices between fibers of a fabric through wiping with roll pressure between the middle and bottom rolls

D:-Producing a surface design in sheet material

Correct Answer:- Option-C

Question89:-To produce thick rubber sheeting, it is preferable to use

A:-A calendar

B:-An extruder

C:-A combination of extruder and calendar

D:-An extruder with roller head

Correct Answer:- Option-D

Question90:-Continuous vulcanization of an extruded sponge profile can be done by

A:-Rotocure

B:-Microwave curing

C:-LCM cure

D:-Fluidized bed cure

Correct Answer:- Option-B

Question91:-Which of the following curing technique has highest heat transfer coefficient?

A:-Hot air oven

B:-Hot air tunnel

C:-Fluidized bed curing

D:-Liquid curing method

Correct Answer:- Option-D

Question92:-The usual formula for calculation of tensile strength of rubber compound is

A:-Breaking load/ cross sectional area at the time of breaking

B:-Breaking load/thickness of the sample

C:-Breaking load/original cross sectional area of the sample

D:-Load at 300% elongation/original cross sectional area

Correct Answer:- Option-C

Question93:-Troughability test is required in

A:-Trolley wheel

B:-Coated fabric

C:-Rail pad

D:-Conveyor belt

Correct Answer:- Option-D

Question94:-_____ and _____ monomers are used in reactions injection molding process

A:-Aminocaproic acid and water

B:-Diamine and diol

C:-Diisocyanate and polyol

D:-None of the above

Correct Answer:- Option-C

Question95:-Aniline point testing method is used for

A:-MBT

B:-Sulphur

C:-ZnO

D:-Process oil

Correct Answer:- Option-D

Question96:-The most common standard conditioning atmosphere is

A:-23°C and 50% relative humidity

B:-23°C and 65% relative humidity

C:-20°C and 50% relative humidity

D:-20°C and 65% relative humidity

Correct Answer:- Option-A

Question97:-The crosshead speed/strain rate used to for tensile testing of brittle materials like polystyrene is

A:-500 mm/min

B:-50 mm/min

C:-5 mm/min

D:-None of these

Correct Answer:- Option-C

Question98:-In HDT test, a deadweight load is applied at the center of the specimen which is sufficient to produce a maximum fiber stress of

A:-300 psi

B:-264 psi

C:-250 psi

D:-500 psi

Correct Answer:- Option-B

Question99:-_____ is used to measure the curing characteristics of the rubber compounds

A:-Mooney viscometer

B:-Moving die rheometer

C:-Goodrich flexometer

D:-Ross flexometer

Correct Answer:- Option-B

Question100:-Which property is more important for seals

A:-hardness

B:-Flex fatigue

C:-Stress relaxation

D:-Tensile strength

Correct Answer:- Option-C