T.Y. B. Pharmacy
Sem - V
17/12/2025

Time: 3 Hrs **Marks:75**

N.B.: 1. All questions are compulsory
2. Figures to right indicate full marks

Note: All Questions are compulsory

Q. I	**Multiple Type Question (Each MCQ Carries 1 mark)**	**20M**
1	What are the two main five-carbon building blocks	**1M**
a	IPP and DMAPP	
b	ATP and NADPH	
c	Acetyl-CoA and Mevalonic acid	
d	Squalene and Farnesyl pyrophosphate	
2	Which radioactive isotope is the most suitable for studying sulfur-containing secondary metabolites like glucosinolates?	**1M**
a	^{14}C	
b	^{3}H	
c	^{35}S	
d	^{32}P	
3	Which plant is the chief BioSource of diosgenin, a steroidal sapogenin used to synthesize corticosteroids and contraceptives?	**1M**
a	*Dioscorea species*	
b	*Rauwolfia serpentina*	
c	*Digitalis lanata*	
d	*Atropa belladonna*	
4	Reserpine, obtained from *Rauwolfia serpentina*, reduces blood pressure. Structurally, it belongs to:	**1M**
a	Quinoline alkaloid	
b	Isoquinoline alkaloid	
c	Pyridine alkaloid	
d	Indole alkaloid	
5	In the large-scale extraction of glycyrrhizin from liquorice, which medium is most suitable due to its polar nature?	**1M**
a	Hexane	
b	Ether	
c	Aqueous ethanol	
d	Petroleum ether	
6	Guggul (*Commiphora mukul*) is a resin that has gained importance in modern medicine due to its:	**1M**
a	Hypoglycemic activity	
b	Hypolipidemic activity	
c	Sedative effect	
d	Bronchodilator property	

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7 Senna, a glycoside-containing drug, is mainly used in: 1M

a Treatment of constipation

b Treatment of diarrhoea

c Treatment of bronchitis

d Treatment of diabetes

8 Gentian is classified chemically under which group of secondary metabolites? 1M

a Volatile oils

b Alkaloids

c Carotenoids

d Iridoids

9 Which of the following statements about β-carotene is *correct*? 1M

a It is a water-soluble pigment found mainly in animal sources

b It is a precursor of Vitamin C and acts as a reducing agent

c It is an alkaloid used for its analgesic properties

d It is a fat-soluble yellow to orange pigment found in plants

10 When the ethanol extract of Benzoin is tested with acetic anhydride and concentrated H_2SO_4, a violet colour appears. What does this indicate? 1M

a Presence of free acids

b Presence of aromatic resins

c Presence of alkaloids

d Presence of coumarin

11 While performing the ferric chloride test on a plant extract, a deep blue-black coloration indicates the presence of _____. 1M

a Benzoin

b Asafoetida

c Catechu

d Colophony

12 During the extraction of Atropine, which of the following steps is primarily used to convert the alkaloid into a water-soluble form? 1

a Formation of salt

b Extraction with chloroform directly

c Precipitation with picric acid

d Steam distillation

13 Which property of curcumin allows its selective extraction from *Curcuma longa*? 1

a Basic nature

b Solubility in organic solvents

c Volatility

d Formation of a precipitate with alkali

14 Which technique is primarily used in its industrial isolation of Menthol? 1M

a Steam distillation

b Acid hydrolysis

c Cold pressing

d Column chromatography

15 ____ is commonly used industrial process to obtain Caffeine. 1M

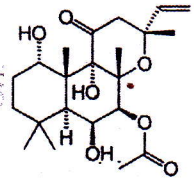
a Acid hydrolysis

b Sublimation

c Steam distillation

d Aqueous extraction followed by basification

16 Following compound is from the chemical class of _____ 1M



a Forskolin

b Quercetin

c Kaempferol

d Rutin

17 Which of the following is commonly used as a supercritical fluid for extraction? 1M

a Water

b Ethanol

c Carbon dioxide (CO_2)

d Hexane

18 Rutin is also known as: 1M

a Quercetin-3-rutinoside

b Kaempferol-7-glucoside

c Hesperidin-3-rutinoside

d Quercetin-7-glucoside

19 Which modern technique can simultaneously separate and quantify multiple components in a crude drug extract with high precision? 1M

a Thin Layer Chromatography

b High Performance Liquid Chromatography (HPLC)

c Soxhlet Extraction

d Column chromatography

20	Which technique can be used to identify the functional groups present in a purified plant compound?	1M
a	Column Chromatography	
b	UV-Visible Spectroscopy	
c	Gel Electrophoresis	
d	Infrared (IR) Spectroscopy	

Q. II	**Answer any TWO of the following**	20M
1	a Write a short note on methods used to investigate biosynthetic pathways using radio tracers.	10M
	b. Write a note on the biological source, chemical constituents, chemical tests, and uses of Asafoetida	
2	Write a short note on the source, industrial production, estimation, and uses of the Podophyllatoxin and Quinine.	10M
3	Write a short note on the following techniques in the herbal drug analysis a. Thin-layer chromatography b. Gas Chromatography	10M

Q. III	**Answer any SEVEN of the following**	35
1	Illustrate the biosynthetic pathway involved in the formation of phenylalanine.	5M
2	Discuss source, chemistry, and uses of the Opium alkaloid.	5M
3	Write a short note on flavonoids with suitable examples.	5M
4	Classify triterpenoid glycosides. Write a note on the source and chemistry of Liquorice with suitable structures.	5M
5	Discuss the phytochemistry of Senna with suitable structures, and give the chemical tests for identification.	5
6	Discuss the extraction, isolation, and analysis of Citral	5
7	Write a note on the industrial production of the following a. Taxol b. Vincristine	5
8	Enlist various modern methods of extraction and explain any one in detail.	5
9	Discuss the principles and procedure of gel electrophoresis Mention its applications in the crude drug analysis.	5